ECONOMIC ASPECTS OF COMMERCIAL CATTLE FEED LOT OPERATIONS IN KANSAS

by

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TABLE OF CONTENTS

INTRODUCTION 1

OBJECTIVES 7

METHODOLOGY. 8

REVIEW OF LITERATURE 9

EXTENT AND TREND OF COMMERCIAL CATTLE FEEDING IN KANSAS. 15

  Rate of Expansion 15

  Sectional Growth Differences. 21

OWNERSHIP STATUS 26

  Ownership of the Feed Lot and Equipment 26

  Ownership of the Cattle Fed 29

ANALYSIS OF FEEDER CATTLE PROCUREMENT METHODS. 34

  General Comments. 34

  Marketing Channels Used in Purchasing Feeder Cattle 40

  State of Origin of Feeder Cattle. 41

FEEDING AND OPERATIONAL PRACTICES. 43

  Description and Evaluation of Contracts and Types of Agreements. 43

  Size of Lot and Capacity Utilization. 48

  Crop Production 52

  Feed Handling Facilities and Techniques Used. 52

  The Ration. 55

  Feed Conversion, Rate of Gain, and the Feeding Margin 59

  Manure Disposal 63

  Co-Existence of Hog Feeding 66

Labor Utilization 67

Disease Control Measures. 69

COST STRUCTURE OF THE ENTERPRISE 71

Factors Associated with Investment in a Commercial Cattle Feed Lot. 71

Appraisal of Operating Costs and Income 77

Cost-Income-Profit Model. 85

ANALYSIS OF SLAUGHTER CATTLE DISPOSITION METHODS 95

General Comments. 95

Grades of Finished Cattle 101

Marketing Channels Used in Disposing of Finished Cattle . . . 102

State of Destination of Finished Cattle 105

IMPLICATIONS OF CURRENT TRENDS IN COMMERCIAL CATTLE FEEDING IN KANSAS. 107

Growth Stimulating Factors. 107

Growth Inhibiting Factors 111

Probable Future Development 114

SUMMARY AND CONCLUSIONS. 116

ACKNOWLEDGMENT 122

LITERATURE CITED 123

APPENDIX I, PERTINENT FACTS COMPILED 125

APPENDIX II, SCHEDULE USED IN OBTAINING DATA 128

INTRODUCTION

Agricultural commercialization has developed increasing momentum in the United States during recent years at a rate not unlike the agricultural mechanization of earlier decades. Just as technological developments and applications have revised production techniques of the past, commercialization is reorganizing the traditional economic structure of agriculture at the present. This apparent change has not gone unnoticed but has instead attracted considerable attention of late. The impact of this economic development affects consumers and processors of agricultural products as well as many individual producers. Future policy implications may also be apparent in the extent and degree of commercialization.

The various segments within agriculture have experienced different rates of change from individual self-owned and financed production units to some level of commercialization (risk and finance divided custom producing units). The extent of commercial production of most crops has been established for some time. However, in the case of poultry and certain classes of livestock, production methods have turned in the direction of the commercial system (9).

Whereas 95 percent of all broilers are produced on a commercial basis less than 2 percent of all hogs are raised under contract on a national level. No estimate of the percentage of commercially produced dairy or beef cattle is available although in both cases apparent increases in this type production are in evidence in particular sections of the country. In the case of beef cattle, commercial or custom production exists primarily in the form of cattle feeding.

It was cattle feeding with which this study was primarily concerned. More specifically it involved the commercial feeding of cattle in the state of Kansas. Commercial cattle feeding is herein defined as the practice of the owner of a feed lot and facilities accepting under pre-arranged agreement and feeding cattle owned by an outside interest or another party. A cattle feeding operation therefore classifies as a commercial feed yard if in addition to cattle owned and fed by the operation itself it also receives and feeds cattle on a contract basis for other parties.

To appreciate the role of beef cattle production in general and of cattle feeding in particular in Kansas as related to the total national scale of production a brief review of certain facts is in order. On January 1, 1959 Kansas ranked fourth as a state in the number of all cattle and calves on farms, and fourth also in the number of total beef cattle and calves on farms (12). Ranking fifth in the number of all cattle and calves on farms in 1958 and ninth in 1957, Kansas maintained a fifth place ranking on the average for the period 1947-56. With regard to the total dollar farm value of all cattle and calves on farms January 1, Kansas ranked seventh in 1958, 10th in 1957, and eighth on the average for the period 1947-56 (13). The foregoing relationships are compiled below (Table 1).

Kansas beef cattle production has historically contributed a significant influence on the over-all cattle industry of the nation. The effect of commercialization in the state should not be an inhibitor of the future role that Kansas may play in the national beef cattle scene. A shifting comparative advantage in the cattle feeding industry has resulted in a relative loss in the corn belt while the Western and Southwestern states have expanded cattle feeding at a comparitively greater rate.

With regard to cattle feeding Kansas has actually not kept abreast of certain other states insofar as expansion is concerned (8). In recent years

Table 1. National rank of Kansas: Number and value of all cattle and calves on farms January 1, average 1947-56, annual 1957, 1958 and 1959. Number of beef cattle and calves on farms January 1.

	Number of all cattle & calves	Dollar farm value of all cattle & calves	Number of beef cattle & calves
	rank	rank	rank
1947-56 (average)	5th	8th	5th
1957	9th	10th	7th
1958	5th	7th	5th
1959	4th	6th[1]	4th

[1] Estimated.

Source: Livestock and Meat Statistics, 1957. AMS, USDA, Statistical Bulletin No. 230. Washington: Government Printing Office, 1958.

this undoubtedly was influenced by the prolonged drouth. Kansas declined in rank among states as to the number of cattle and calves on feed January 1 from fourth in the period 1930-34 to 12th in the year 1957 (Table 2).

The declining Kansas cattle feeding position indicated in Table 2 may be accounted for in part by the unfavorable weather conditions but of even greater importance, to the rapid rate of expansion of cattle feeding in the Western States much of which is on a commercial basis. Only in the last eight years have California, Arizona, and Colorado surpassed Kansas in the extent of cattle feeding.

Table 2. Number of cattle and calves on feed in Kansas on January 1, 1930-54 (5 year period averages), annually 1955, 1956, and 1957. National rank as a state.

	Average								Percentage of Total	
	1930-1934	1935-1939	1940-1944	1945-1949	1950-1954	1955	1956	1957	1930-34	1957
Number (1,000 hd.)	273	143	242	266	251	227	182	162	9.1	2.7
Rank	4th	6th	6th	6th	7th	9th	11th	12th	-	-

Agriculture is a major contributor to Kansas personal income. Since 1952 agriculture has ranged between third and seventh among Kansas industries. In 1957, agriculture held a fifth ranking position as a contributor to personal income in Kansas, exceeded only by manufacturing payrolls, trade payrolls, federal payrolls, and state and local payrolls which were onethrough four respectively. The 1958 net farm income is expected to move agriculture again into one of the top three positions (16). In 1956 livestock sales accounted for 57.1 percent of Kansas cash farm marketing receipts, excluding government payments (5). Of the 57.1 percent in livestock and livestock product sales, 54.2 percent was attributed to cattle. Quite clearly the value of Kansas cattle sales have had a substantial effect on the economy of the state. It follows that as commercial cattle feeding is expanded the general level of the economy in the state will also be bolstered.

In the light of surplus stocks of wheat the traditionally abundant Kansas wheat production is destined to yield to some alternative resource allocation and output. Irrigation giving rise to a more assured crop in the form of grain sorghums encourages the feeding of livestock as one of the primary alternatives meriting consideration. Demand for beef, and more specifically fed beef, has been on the increase (Table 3). Expenditures for beef and pork comprise the bulk of that portion of the consumers disposable income that is spent on meat. Since 1951 the proportion of consumers disposable income spent on pork has declined. At the same time, the proportion spent on beef has been reletively stable, with year to year minor variations (Table 4). With a ready supply of available feeder cattle and feed, Kansas is in a strategic position to expand cattle feeding.

Commercial or custom cattle feeding exhibits a number of distinct advantages worthy of brief consideration here and of more extensive elaboration in the forthcoming sections of this thesis.

1. Perhaps the most important of these is the increased economies of

Table 3. Production and civilian consumption of beef, United States, 1951-56.[1]

Year	Production	Consumption	
		Total	Per-capita
	Mil. lbs.	Mil. lbs.	lbs.
1951	8,837	8,472	56.1
1952	9,650	9,542	62.2
1953	12,407	12,113	77.6
1954	12,963	12,737	80.1
1955	13,569	13,306	82.0
1956	14,462	14,114	85.4

[1] Carcass weight equivalent: Dressed weight of cattle.
Source: Agricultural Statistics, 1957, U.S.D.A.

Table 4. Retail value of meat consumed and percent of disposable income spent for beef and pork, 1951-58.

Year	Retail value of meat consumed per person		Retail value of meat consumed as a percentage of disposable income		
	Beef	Pork	Beef	Pork	All meat
	dollars	dollars	percent	percent	percent
1951	39.10	39.60	2.7	2.7	5.8
1952	42.50	38.70	2.8	2.5	5.9
1953	42.40	37.50	2.7	2.4	5.6
1954	43.40	36.20	2.7	2.3	5.6
1955	43.70	34.00	2.6	2.0	5.2
1956	44.60	32.70	2.6	1.9	4.9
1957	47.20	34.40	2.6	1.9	5.0
1958[1]	51.00	36.60	2.9	2.0	5.3

[1] 1958 figures are preliminary.
Source: Agricultural Marketing Service, U.S.D.A.

scale as well as continuity of operations. Added efficiency and a more nearly full utilization of fixed resources are generally associated with a thriving commercial feeding operation.

2. Of equal importance is the distribution of risk. Whereas the land, labor, management, and capital equipment investment is borne by the feed lot owner the financial investment in the cattle is shouldered by another when the cattle are fed on a contract basis.

3. A commercial cattle feeding operation envelops certain vertical integration features revealed in various possible forms. A farming program of crop production may be integrated with the cattle feeding operation. A manure dehydrating plant lends itself well to a cattle feeding enterprise in some areas. Extensive grain processing facilities are generally an integral part of a feed yard and may be developed to possess the status of a local grain elevator and mill. Merchandising grain through cattle feeding may be regarded as a degree of integration. Finally, meat processors placing their own cattle in commercial yards have reason to look favorably toward this system of fed cattle production.

4. The concluding advantage of custom cattle feeding is felt chiefly by the meat processing industry and also by the consuming public in general. Contract feeding tends to stabilize market supplies which in turn has a three-fold effect. (a) Operational efficiency in the meat packing industry is improved. (b) Returns from the laborers guaranteed work week in that industry are more adequately realized. (c) More uniform retail prices are reflected resulting in a more stable demand.

The chief disadvantages of commercial cattle feeding are:

1. Extensive credit facilities are required at times. This need stems not only from initial investments in capital equipment and improvements but also from the advance financing of the feed and grain supply necessary to maintain an adequate level of operation.

2. Competent labor is difficult to obtain in some areas.

3. The squeeze that large scale commercial cattle feeding may place on small individual self ownership producing units may be regarded by some as a disadvantage. This point is herein included only inasmuch as it is so

regarded by a segment of the population as based on individual value judgements and is not considered here to be an economic disadvantage.

OBJECTIVES

The growing awareness in the shifting area of cattle feeding and the recent interest expressed in commercial cattle feeding in Kansas precipitated a need for more adequate information on this subject. A search for an alternative resource allocation framework within Kansas agriculture led to the logical conclusion that the necessary and existing changeover from wheat to grain sorghum production would result not only in a need for an outlet for this increasingly important crop but also in a renewed advantage in Kansas for potential livestock feeding. Wheat itself has in the past been an efficient livestock feed grain when its relative price was not prohibitive for feed use.

Considering first the feasibility of studying vertical integration per se in the Kansas cattle industry it was finally decided to restrict the study to commercial cattle feeding regarding integration only insofar as it is encompassed in this segment of the cattle industry. Emphasis, therefore, was placed on numerous of the economic aspects of custom cattle feeding in the state.

The specific objectives of this study were:

1. To determine the extent and trend of commercial cattle feeding in Kansas.
2. To establish the ownership status of the yard and equipment and of the cattle being fed.
3. To analyze the method of procurement of feeder cattle and the method of disposition of fat cattle.

4. To compare the feeding and operational practices.
5. To describe and evaluate contracts and types of agreements.
6. To explore the cost structure and level of efficiency of various sizes of operations.
7. To discover deficiencies in the commercial cattle feeding industry and suggest possible means of improvement or correction.
8. To examine the implications of current trends in commercial cattle feeding.

Of the foregoing eight specific objectives listed the primary purpose of this study was to examine the implications of current trends in commercial cattle feeding in Kansas. The concluding section of this thesis is devoted to accomplishing this goal.

METHODOLOGY

Sixteen commercial cattle feeding operations were personally interviewed.[1] These 16 feed lots comprised the entire population of such operations in Kansas thereby alleviating the necessity of drawing a sample. This study was therefore in effect a census of the commercial cattle feeding industry in Kansas.

The schedule used was developed after preliminary interviews and discussions with individuals familiar in part or in direct contact with custom cattle feeding as it existed then. In this manner a sound foundation was formed on the particular aspects of the industry in need of investigation.

Two sources were utilized in obtaining a listing of the cattle feeders in the state, one of these being the Kansas State Crop and Livestock

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[1] A copy of the interview schedule is included as Appendix II.

Reporting Service and the other the State Livestock Sanitation Commission Office. In an effort to determine which of the listed cattle feeders classified as "commercial", a letter requesting this information was sent to particular county agricultural agents concerned. In spite of this screening procedure it was necessary to contact several feed lots personally in order to establish whether or not it was to be included in the population of commercial feed yards.

As previously indicated a commercial feed lot was defined as one in which some degree of custom or contract feeding of another party's cattle was practiced under some prearranged agreement. This definition necessarily eliminated several large cattle feeding establishments that reported feeding only cattle owned by the operation itself. It also removed from the study at least one packer that owned and operated its own cattle feed yard but did no custom feeding for outside interests.

The 16 eligible commercial cattle feeding operations were interviewed in the early fall of 1958. The major portion of the information obtained was concerned with the year 1957 with a substantial amount also dating back to the year operations began. A small segment was with regard to the year 1958.

Nine of the 16 feed lots were located in the Western half of the state while the remaining seven were in the Eastern half. The locations of commercial cattle feed yards in Kansas are shown in Fig. 1.

REVIEW OF LITERATURE

Previous investigations of the economics of commercial cattle feeding have thus far been at a minimum. Numerous studies have been made relating to cattle feeding as such, however, a relatively small portion of the total has

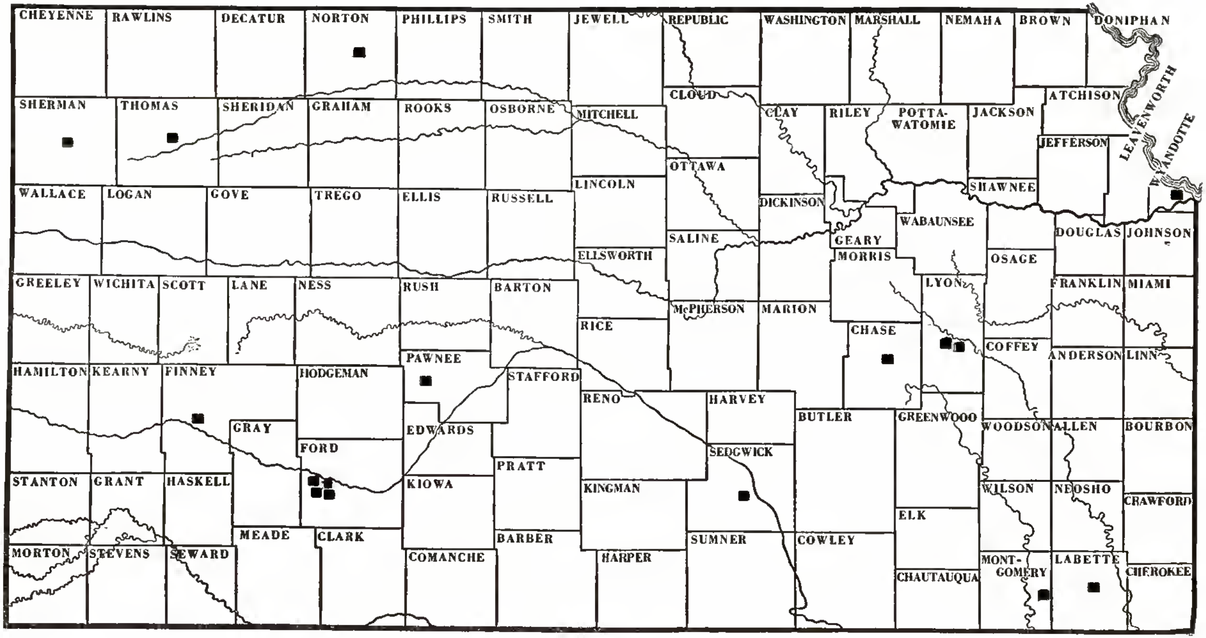

Fig. 1. Location of commercial cattle feed lots in Kansas, 1958.

had to do with the economics of the enterprise as the primary objective. In a majority of the cases applied production research has been carried on with the economic implications secondary. In Kansas this was the first such investigation undertaken. Other economic studies concerned with cattle feeding in general and custom feeding in part are to be found in a comprehensive search of the field. This review will cite a representative sample of the whole, with the intent purpose of including in it literature applicable to each of the respective objectives of this study.

The literature reviewed was composed of two major categories:

1. Experiment station research in the form of theses, bulletins, and publications.
2. Non-academic research in the form of bulletins, circulars, publications, and newsletters.

Included in the experiment station research are six theses each of which applies to some phase of this particular study.

In 1949, Allen (3) set out to determine the accuracy of grading under the present cattle marketing system by testing buyers' estimating ability. He concluded that there was a definite need for more empirical standards for carcass grades.

In 1948, Van Meir (7) analyzed the year to year level of feeder cattle prices and the factors that influence price. As part of his analysis he determined the demand function for buyers and sellers. It was his conclusion that the future expected price of slaughter cattle influenced the price of feeder cattle more than did the number of cattle on feed January 1. Van Meir further related the fact that the following two major factors influenced most the price of feeder cattle:

1. Quantity and price of feed.
2. The conjecture of profits.

In 1958, Ahrens (2) analyzed the profitability of various systems of beef cattle production in northeast Kansas. He found that creep fed calves, full fed steers of lighter weights, and deferred fed steers had in the past been the most profitable of the 10 types of systems he studied.

In 1948, Taylor (6) attempted to determine the most profitable system of beef cattle production for six different Kansas areas. His findings indicated that for each respective area, some modified type of deferred feeding system was most profitable.

In 1954, Keating (4) studied the effects resulting from various concentrate-roughage ratios (bulkiness or concentration). He found that when using high quality roughage the optimum concentrate-roughage ratio for short periods is 5:1, whereas for long periods it is 3:1. He further concluded that on a high concentrate-low roughage ration, it takes more grain and less hay per 100 pounds of gain than if the ration were physically balanced. Keatings work also included a comparison of corn and milo as cattle feeds. He found that although a milo ration is more palatable and results in a larger quantity consumed coupled with greater daily gains, the carcasses resulting from milo fed cattle had slightly lower quality than those fed corn.

In 1959, Norton (5) evaluated the various types of livestock marketing channels used by Kansas farmers in 1956 as compared to 1940. He found that terminal markets were the most important outlet for all three species of livestock with local auctions ranking second in importance. He also discovered that virtually all Kansas livestock is sold either by the live-weight method or by the head with but a very little being sold by the carcass weight or carcass weight and grade method. Norton further reported that local auctions were the most important source of farmer purchases of both cattle and hogs. He was able to conclude that terminal markets and local auctions had an increase in the proportion of all livestock received with all other market outlets sustaining a loss over the years 1940 to 1956.

In 1927, Hopkins (10) analyzed the Iowa cattle feeding enterprise and the factors that affect its profitability. This is one of the oldest studies on the economics of cattle feeding. The general conclusions withdrawn from this work indicate that many factors influence the profitability of feeding cattle, the most important of which is the cattle-corn ratio. Other contributing factors determining the efficiency of fattening cattle are such things as:

1. Grade of the feeders (a 10 percent greater price paid for feeders resulted in $1.14 greater net profit per head).
2. Finish of cattle at slaughter date: (Higher priced "higher grade" cattle gained more efficiently).
3. Quantity of feed consumed per day.
4. Length of the feeding period.
5. Size of the herd and labor utilization.
6. Price margin.
7. Rate of gain per day.
8. The combination of the above factors.

Hopkins found also that the average feeding ratio for the farms studied was 100 pounds of fat cattle to 15.06 bushels of corn. Increasing the ratio to 1:16 yielded a greater net profit of $2.40 per head. The seasonal peak in 1927 for fat cattle prices was found to be August or September, with a trough in February. For feeder cattle the peak prices were in May while the low prices were in November or December. Hopkins concluded that a feeder's success depends upon his ability to anticipate the future movements in fat cattle prices.

In 1956, Knight (11) studied the importance of beef cattle production in southeastern Kansas as well as the resources used by producers. His budget analysis presented figures on all costs and returns factors.

Non-academic research agencies have similarly studied the beef cattle feeding situation. Three samples of such works are presented in this review.

In 1937, Randell (17) determined the development and importance of contract feeding in the livestock industry as well as evaluating the requisites of a feeder handling stock under contract. Although contract feeding dates back even earlier than 1930 it was not till then that it began to expand. Randell listed the following essential characteristics of a feeder under contract:

1. The ability to feed livestock, experience, judgement, and information utilization.
2. Ample quantity of feed on hand.
3. Facilities for handling livestock.
4. Good credit standing.
5. Upright character and the ability to "stick with it."

It was concluded that a third party or supervising agent was desirable to serve the following functions:

1. Make the contract.
2. Supervise the feeding and handling of the stock.
3. Market the stock and distribute the returns.

He felt that contract feeding agreements do have a role in the livestock industry.

In 1957, Hopkins (15) related the development and importance of cattle feeding in California, the cost structure of the industry, and also the cattle price determinants. His general conclusions were that greater numbers of cattle will be fed in larger feedlots in a more competitive industry since the economical upper limit on the yard size has not yet been reached. He classified feeders as: Farm feeders, owner feeders, commercial feeders, and combined owner-commercial feeders. Although cattle feeding was slow to get started in California, farm feeding as well as commercial feeding are gaining in importance whereas meat packer or crop processor owned yards are declining in importance. Hopkins stressed the importance of maximizing the feed yard capacity. The break even margin is determined as an inverse relation to price paid for feeders and directly with the price of feed. A knowledge of price seasonality is essential to successful feeding to reduce somewhat the uncertainty. Generally, lighter steers are less risky than heavier steers.

In 1957, Breimyer (8) conveyed to corn belt livestockmen the trends that are taking place in the changing beef cattle industry. He summarized the trend in the following nine points:

1. The corn belt losing its dominance but a rapid increase in the over-all volume of feeding with the fastest gains in the West.
2. A quicker turnover of cattle in the feed lots particularly in the Southwestern States.
3. More specialized feeding methods: New rations and additives.
4. New large scale factory-like organization in some areas.
5. Smoother monthly distribution of fed cattle marketings.

6. Reduced emphasis on the prime grade and more on moderate finish from high good to average choice.
7. A gradual increase in the weights to which cattle are fed, partly the result of using stilbestrol.
8. More alertness to market trends by feeders.
9. In his concluding remark, Breimyer made the following statement: "Cattle feeding will continue to be a dynamic industry, and the men and the regions that can foresee trends and keep in the vanguard of the advances will fare best."

This review of literature has been only a small sample of the vast information available relevant to the subject cattle feeding, but it does represent that which is available. It relates work done in each of the key areas with which this study was concerned.

It is noteworthy to compare Breimyer's concluding remark to the basis and justification of the present study.

EXTENT AND TREND OF COMMERCIAL CATTLE FEEDING IN KANSAS

Rate of Expansion

During 1957 an estimated 390,000 head of cattle were fed in all Kansas feed lots. Of that total number of head fed, 147,848 or 37.9 percent were reported as having been finished in commercial feed lots. Contrasting similar figures for the year 1948, it was found that only 24,600 head of the estimated total 468,000 head were fed in commercial feed lots comprising but 5.2 percent of the total. The increasingly important role that commercial cattle feeding has taken in Kansas from 1948 to 1957 illustrates a tendency toward a more intensive form of fed cattle production (Fig. 2).

The two computed regression lines plotted in Fig. 2 reveal the upward trend of commercial cattle feeding in Kansas from 1948-57. During that same time period the total number of cattle finished in Kansas displayed a downward tendency. The net result was a pronounced percentage increase in the extent of commercial cattle feeding as compared to the total number fed in each year during the period 1948-57 as measured against the preceding year with the exception of the change from 1948 to 1949 (Table 5). The limitational feature of this apparent trend is the fact that the measure of the number of head fed in commercial feed yards considers only the 16 lots included in this study therefore only those in existence in 1957. This would imply that no other commercial feed lots were in operation prior to 1957 except the 16. An active commercial feed lot that went out of business before this study was begun would modify the picture but only in favor of more extensive commercial feeding. Recognizing this possibility the same generalizations may be justifiably concluded in view of the added fact that certain prominent long-time established feeders point out that there were few, if any, feed yards practicing custom feeding that have gone out of business during the past 10 years.

The downward trend of total cattle feeding in the state may logically be attributed to the drouth years of 1952-57. On the national level, total beef cattle numbers, were increasing during those same years. After having reached a cyclical low point in 1948 they surged to a new high of more than 62 million on January 1, 1956. The temporary effect of the localized unfavorable drouthy conditions that encompassed most of Kansas is further highlighted by the fact that immediately following climatic relief cattle feeding

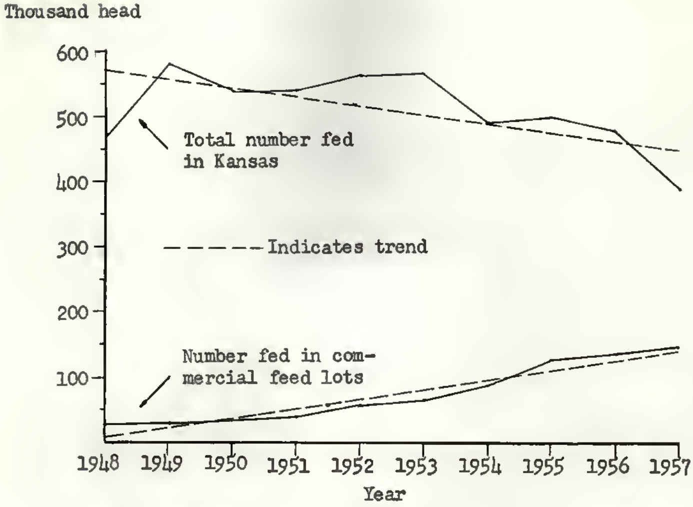

Fig. 2. Number of cattle fed in Kansas: Total number fed and those fed in commercial feed lots, including trend lines, 1948-57.

in Kansas once again began to increase. This is apparent in the 9.2 percent increase in the number of cattle finished in the state in 1958 (preliminary estimate of 426,000 head) as compared to the 390,000 fed in 1957.

From Fig. 2, two significant reductions in the total number of cattle fed may be observed, these being from 1953 to 1954 and from 1956 to 1957. At the same time the volume of cattle fed in commercial yards continued to expand. None of the 10 commercial lots existing in 1953 cut back production the following year but instead either maintained or increased production in 1954. In fact, two new such firms started operations in 1954. Similarly, the 15 feed lots operating in 1956 did not reduce over-all production the following year but rather expanded it by 11 percent in 1957. Although three of the 15 did contract somewhat, the increased feeding in the remaining 12 lots as well as the addition of another new lot in 1957 offset the suppressing

Table 5. Development of cattle feeding in Kansas: Commercial feeding compared to the total number fed, 1948-57.

Measurement	Year									
	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Number of cattle fed in commercial lots	24,600	27,300	32,300	38,300	50,500	68,061	86,821	128,122	133,197	147,848
Percent change from preceding year	-	11.0	18.3	18.6	31.8	34.8	27.6	46.6	4.0	11.0
Percent change from 1948	-	11.0	31.3	55.7	105.3	176.7	252.9	420.8	441.4	501.0
Total number of cattle fed in Kansas[1]	468,000	581,000	541,000	541,000	560,000	567,000	490,000	498,000	476,000	390,000
Percent change from preceding year	-	24.1	-6.9	0	3.5	1.2	-13.6	1.6	-4.4	-18.1
Percent change from 1948	-	24.1	15.6	15.6	19.6	21.2	4.7	6.4	1.7	-16.7
Number of cattle and calves on feed Jan. 1	200,000	280,000	252,000	252,000	265,000	270,000	216,000	227,000	182,000	153,000
Percent change from preceding year	-	40.0	-10.0	0	5.2	1.9	-20.0	5.0	-19.8	-15.9
Percent change from 1948	-	40.0	26.0	26.0	32.5	35.0	8.0	13.5	-9.0	-23.5

Continued

Table 5 (cont.). Development of cattle feeding in Kansas: Commercial feeding compared to the total number fed, 1948-57.

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Number of cattle fed in commercial lots as percentage of 40,177 (average number fed per year in commercial lots for 6 year period, 1948-53)	61.2	67.9	80.4	95.3	125.7	169.4	216.1	318.9	333.4	368.0
Total number fed in state during year as percentage of 543,000 (average number fed per year in state for 6 year period, 1948-53)	86.2	107.0	99.6	99.6	103.1	104.4	90.2	91.7	87.7	71.8
Number of cattle fed in commercial lots during year as percentage of 543,000 (average number fed per year in state for 6 year period 1948-53)	4.5	5.0	5.9	7.0	9.3	12.5	16.0	23.6	24.5	27.2
Number of cattle fed in commercial lots as percentage of total number fed in state for each year	5.2	4.7	6.0	7.0	9.0	12.0	17.7	25.7	28.0	37.9

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[1] Official reports on numbers fed are not available 1948-54. Total numbers fed in state for the years 1948-54 were estimated by means of regression using available data for the years 1955-58. The independent variable was the number of cattle on feed January 1. The dependent variable was the number fed during the year.

effect of the three and resulted in the continued gradual expansion of commercial cattle feeding.

An additional point of significance revealed in Fig. 2 is the sharp increase in the number of cattle fed in commercial feed lots in 1955 as compared to 1954. The 46.6 percent increase in that year over 1954 was the most striking expansion in any single year for the entire 10 year period. The implication of this rise and the accompanying, but to a lesser degree, rise in the total number of cattle fed in Kansas rests in part on the relationship of the relative prices of feeders and fat cattle. Generally, when feeder cattle prices are low relative to fat cattle prices, there is more incentive for the owner of the cattle to temporarily withhold them from the market and to feed them himself anticipating a greater profit by selling them later as finished cattle. Lacking facilities and feeding know-how the rancher is prone to accept the services of a commercial cattle feed yard. Approaching a cyclical peak in cattle numbers in the years 1953-56 the abundant supply of cattle did in fact depress feeder cattle prices and widened the margin between feeders and slaughter cattle as compared to 1950-51. This situation, though not sole determining to be sure, may account in part for the increased rate of expansion of commercial cattle feeding in recent years.

In 1957 an increase in the number of cattle fed in commercial feed lots of 501 percent over 1948 clearly illustrates the rapid development of this system of fed cattle production in Kansas. Not only have existing lots expanded their own operations in every case through successive years, but also new yards have been established in each year, except 1952, during the 10 year period at a rate of from one to three new lots per year (Table 6).

Table 6. Number of commercial cattle feed lots in Kansas: Year established and locational development, 1948-57.

Number of commercial feed lots	Year									
	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Total in operation	3	4	5	8	8	10	12	13	15	16
Established during year	0	1	1	3	0	2	2	1	2	1
Operating in Eastern half of state	3	4	4	6	6	7	7	7	7	7
Operating in Western half of state	0	0	1	2	2	3	5	6	8	9

Sectional Growth Differences

In addition to the rapid rate of expansion commercial cattle feeding growth is characterized by another feature that undoubtedly has future implications. As exhibited in Table 5 the Eastern half of the state dominated both the extent and the development of commercial cattle feeding from 1948-52. Beginning in 1953, however, the Eastern area ceased to attract prospective commercial feed yard operators while the Western half of the state apparently displayed a new appeal in view of the fact that seven new feed lots were established in that area during the five year period 1953-57.

The Eastern half of the state has maintained its dominance in the volume of cattle fed in commercial feed yards but its position is rapidly declining in relative importance in light of the rate of expansion of custom feeding in western Kansas (Fig. 3). Whereas in 1948 the three existing feed lots, all

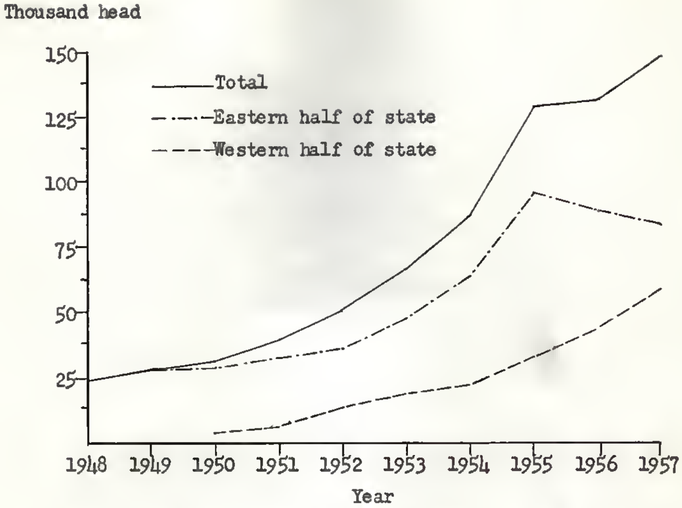

Fig. 3. Number of cattle fed in commercial feed lots in Kansas: Comparison between Western and Eastern area development, 1948-57.

in eastern Kansas, accounted for 100 percent of the states' commercial feeding, in 1957 the seven existing feed lots in the Eastern half of the state comprised 56.6 percent of the cattle numbers finished in commercial feed yards in the state. The most striking decline occurred in 1956 and 1957. In both of these years the seven Eastern area feed lots actually fed fewer cattle as compared to the preceding year, while at the same time the Western area feed lots displayed marked increases in the number of cattle fed as compared to the preceding year (Table 7).

The sectional growth trend of commercial cattle feeding shifting obviously from the Eastern to the Western area of the state in a 10 year time span must be recognized if any future implications are to be drawn.

Irrigation development in the state has parallelled commercial cattle feeding expansion in recent years. The most striking growth has in both

Table 7. Rate of expansion of commercial cattle feeding in Kansas: Comparison between Western and Eastern area development, 1948-57.

Measurement	Year									
	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
(Western)										
Total number fed	0	0	4,000	5,500	14,000	18,500	22,200	32,500	44,000	64,200
Percent change from preceding year	-	-	100.0	37.5	154.5	32.1	20.0	46.4	35.4	45.9
Number fed in Western area as percentage of total fed in commercial lots	0	0	12.4	14.4	27.7	27.2	25.6	25.4	33.0	43.4
(Eastern)										
Total number fed	24,600	27,300	28,300	32,800	36,500	49,561	64,621	95,622	89,197	83,648
Percent change from preceding year	-	11.0	3.7	15.9	11.3	35.8	30.4	48.0	-6.7	-6.2
Number fed in Eastern area as percentage of total fed in commercial lots	100.0	100.0	87.6	85.6	72.3	72.8	74.4	74.6	67.0	56.6
(Combined)										
Total number fed	24,600	27,300	32,300	38,300	50,500	68,061	86,821	128,122	133,197	147,848

cases been in the Western areas of the state. Concurrent expansion is not coincidental but rather is apparently associated. It is quite logical to conclude that increased cattle feeding would follow more extensive land irrigation since cattle feeding is dependent upon a readily available and stable feed grain and roughage supply. In an area previously characterized by abundant wheat production with uncertainty the rule rather than the exception, livestock feeding displayed no particular advantage. As unexploited water supplies were put to use, however, western Kansas became more nearly a sure-crop area lending itself well to new crops and especially to the production of grain sorghums.

An uncompleted study of water problems in Kansas, underway at the present time, clearly shows that irrigation in the state has experienced rapid expansion during the past eight years and relatively more so in western than in eastern Kansas. The irrigation study is segmented such that specific areas of the state are analyzed independently.

The Cimarron area analysis segment of the study has been completed and is in published form (14). Extremely rapid expansion of irrigation has been exhibited there. The development may be attributed to: (a) Prolonged drouth, (b) availability of ground water, and (c) availability of natural gas for use as a pumping system fuel. The most significant growth of irrigation in the Cimarron area was experienced in the period January 1, 1955 to July 1, 1957. During that period the acreage included in new applications to appropriate irrigation water surpassed the total acreage of all previous rights and applications made prior to January 1, 1955. The development of irrigation in the Cimarron area is compiled in Table 8. In that southwest area of Kansas the principal crop irrigated is grain sorghum, comprising 59.3 percent of the

Table 8. Development of irrigation in the Cimarron area of southwestern Kansas, 1950-57.[1]

Year	Acreage represented in irrigation water rights[2]	Acres Irrigated	Irrigated Acreage	
			Percent increase over preceding year	Percent increase over 1950
1950	57,306	35,290	--	--
1951	60,350	41,310	17.1	17.1
1952	66,773	47,840	15.8	35.6
1953	86,053	58,240	21.7	65.0
1954	118,209	92,450	58.7	162.0
1955	214,808	159,840	72.9	352.9
1956	275,192	222,320	39.1	530.0
1957	305,163	251,610	13.2	613.0

[1] Source: State Water Plan Studies, Part A, Preliminary Appraisal of Kansas Water Problems, Section 2, Cimarron Unit, Kansas Water Resources Board, September, 1958.

[2] Vested rights, appropriation rights, and applications to appropriate. Based on records from Division of Water Resources, State Board of Agriculture.

total irrigated acreage in the area.

A similar situation may be observed to exist in the Platte Valley in Nebraska and also the irrigated area of northern Colorado.

If commercial cattle feeding is associated with irrigation development as it logically appears to be as indicated by the synonymous rate and location of growth, then the future of the industry in Kansas looks bright indeed, particularly in the irrigated feed grain producing areas. The relationship of the two may not be highly correlated, but it is obvious that the effect of increased irrigation stimulating increased grain sorghum production creates a most favorable atmosphere for further development of commercial cattle feeding. A ready supply of feeder cattle has always existed in Kansas. Combined with a ready outlet for fat cattle and an available supply of feed grains the expansion in commercial cattle feeding experienced thus far can be expected to continue in the future.

OWNERSHIP STATUS

Ownership of the Feed Lot and Equipment

The 16 feeding establishments considered in this study were represented by three basic types of ownership. The single owner, partnership, and corporation units each possess distinct advantages and disadvantages worthy of a brief discussion in this section. Four of the 16 feed yards were single owner units, five were partnerships, and seven were incorporated firms.

The Individual Proprietorship. At the close of 1957 the four single owner establishments in the state had been in operation an average of 5.5 years. The year each of the feed lots began varied from 1949 to 1956. Two were in the Western half of the state and two in the Eastern. Although comprising only 11.8 percent of the total number of cattle fed in commercial lots in 1957, the four proprietorships under consideration were regarded as relatively immature but showing exceptional promise for potential development on three in particular. On only one of the four lots was any of the feed used home grown; the other three purchasing all of the needed feed supply. One of these other three utilized the services of a local cooperative feed mill thereby eliminating an investment in or ownership of extensive feed processing facilities for the time being. The remaining three possessed ownership of feed processing equipment which enabled them to perform all of their own feed milling and mixing.

An individual proprietorship is characterized by one individual owning and managing, assuming all the risks of and deriving all the profits from, an enterprise. The merit in complete decision making freedom and sole profit possession must be measured against the disadvantages of restricted credit extension and the unlimited liability legality that typifies a single owner type of business organization.

The Partnership. In December, 1957 the five partnership type commercial feed lots in the state had been in operation an average of 7.4 years. The year each of the feed yards began varied from 1940 to 1955. Four were in the Western half of the state and one was in the Eastern. The five partnerships under consideration fed 36.8 percent, as a group, of the total number of cattle fed in commercial feed lots in 1957. On three of the five lots a portion of the feed used was home grown the other two purchasing all of their needed feed supply. One of the latter two utilized the services of a local cooperative feed mill, here again, alleviating an investment in or ownership of extensive feed processing facilities. Of the four that owned feed processing equipment three performed all of the necessary feed milling and mixing, the remaining one owned equipment such that about half of the processing was done at the feed lot. Four of the five partnerships were two member agreements while the other consisted of three partners. Generally all partners were bi-laterally active with regard to decision making and management functions although in most cases one member was primarily a financial counter-part of the enterprise.

A partnership is characterized by a contractual arrangement between two or more individuals, each assuming full personal liability for the debts of the joint enterprise. The arrangement may be either written or verbal but is less subject to discrepancies and misunderstandings if it is formally drawn up. Usually capital is more readily available in a partnership than is the case for a proprietorship, however, the paramount disadvantage rests in the unlimited personal liability for the debts of the joint enterprise assumed by the members of the partnership. Certain exceptions allow limited liability to the extent of the amount invested in the business.

The Corporation. The seven remaining feed lots were incorporated and in 1957 they had been in operation an average of 11.3 years. The year each of the feed yards began varied from 1912 to 1957. Two were in the Western half of the state and five in the Eastern. Comprising 51.0 percent of the total number of cattle fed in commercial feed lots in 1957 the seven corporations all owned their own feed processing facilities and in each case performed all the necessary feed milling and mixing. Three of the seven yards raised some portion of the feed supply necessitating ownership of certain farming equipment. With the exception of two extremely large corporations of which commercial cattle feeding is a divergent interest apart from the main function of the business, the number of stockholders per unit reported ranged from two to four.

Corporation laws in Kansas and in particular those applying to corporation farming in the state, do not prohibit the cattle feeding enterprise from corporation organization. This fact was verified by consulting the 1949, "General Statutes of Kansas" and supplements thereto, where it was learned in Article 17, Section 202 A, that:

> . . . no domestic corporation shall be organized and no foreign corporation shall be given permission to do business in this state for the purpose of engaging in the agricultural or horticultural business of producing, planting, raising, harvesting or gathering wheat, corn, barley, oats, rye, or potatoes, or the milking of cows for dairy purposes: . . .

A literal interpretation would be that corporation cattle feeding is excluded from provisions of this statute. Since certain specific enterprises are named it may be assumed, in the absence of other evidence, that if cattle feeding was intended for inclusion it would also have been named. The above passage was preceded in the statute book by the laws governing the establishment of a corporation in which is revealed the number of incorporators necessary to form a corporation. Three or more are needed to sign the charter of a newly organized corporation, however, one of the members may own all of the stock if this situation is so desired. It may be that the statute restricting corporation farming in the state was initially instigated with the intent purpose of including all agricultural businesses but for passage purposes qualified the original generalization by specifying only certain types of agricultural enterprises. Nevertheless, commercial cattle feeding is not now restricted from future expansion by prohibitive corporation laws.

There are numerous kinds of corporations but in general one is characterized as a body of persons chartered by law to carry on a business enterprise. Its major advantages are that its members are not held in unlimited personal liability but stand only to lose their investment in the firm, and further that capital is more readily available to a proven corporation. The role of the corporation in commercial cattle feeding is an important one and one that can influence greatly the extent and rate of development of the industry.

Ownership of the Cattle Fed

The earlier discussion regarding the extent and trend of commercial cattle feeding in the state did not consider the ownership status of the cattle being fed in commercial lots and therefore did not depict the proportions that were actually fed on a contract basis. It would be expected that not all of the cattle finished in commercial feed yards would be fed on a contract basis but that some would be owned by the feed lot owner or operator himself. This was in fact the situation on all of the 16 feed lots studied, the degree of self-ownership varying considerably among them. The trend and rate of expansion of commercial cattle feeding considering only the custom fed cattle is not altered greatly from the same implications drawn by including as well the proportion of self-owned cattle fed in commercial yards. In general, there has been a slight increase in the degree of contract feeding as compared to the extent of self-owned feeding in the 16 lots with certain individual exceptions. Although no specific estimates of the proportions of cattle owned by various types of individuals were obtained for years prior to 1957 it can be concluded from the interview conversations in general that as a whole the relative amount of self-ownership feeding has declined slightly since 1948. Percentage estimates of the various types of ownership of the cattle fed in commercial yards during an average recent year were reported by each of the 16 lots from which was calculated the number and over-all percentage of the different types of ownership (Table 9). The percentages reported were most accurately applied to 1957 cattle numbers reported since in most cases the estimates were withdrawn from that particular average recent year. For purposes of comparison it was felt that the estimated percentages could also be applied to the cattle numbers reported fed in 1955 and 1956 making an adjustment in one feed lot's 1955 percentage breakdown since it was then a significantly different situation than in 1957. Differences on other feed lots were not extreme over the three-year period and where they did exist they were generally offset by an opposite change on another lot.

Over half (61.8 percent) of the cattle finished in commercial feed yards in 1957 were fed on a contract basis, the remaining 38.2 percent belonging to

Table 9. Type of ownership of cattle fed in commercial cattle feed lots in Kansas, 1955-57.

Year	Percentage of cattle fed owned by:					Total
	Feed lot owner or operator	Rancher or farmer[1]	Packer[1]	Livestock dealer[1]	Other	
	%	%	%	%	%	%
1955	39.1	32.0	6.5	18.9	3.5	100.0
1956	38.4	26.6	9.1	23.9	2.0	100.0
1957	38.2	20.5	11.1	28.7	1.5	100.0
Average	38.5	26.1	9.0	24.1	2.3	100.0

[1] Fed on contract basis.

the feed lot owner or operator. This being the case, it is apparent that the 16 feed lots were in business primarily to do commercial feeding in the strict sense of the word.

In Table 9 a definite pattern can be seen under each category of ownership during the period 1955-57. Packers and livestock dealers displayed an upward trend while feed lot owners or operators, ranchers or farmers, and others including businessmen, etc., declined in importance. Each of the five types of ownership will be discussed in the remainder of this section.

Feed Lot Owner or Operator. From 1955-1957 the feed lot owners' and operators' share of the total number of cattle fed in commercial lots declined slightly from 39.1 percent to 38.2 percent with an average for the three year period of 38.5 percent. They accounted for the largest single proportion of any of the five categories of cattle ownership. Self-owned cattle provide the important dual function of increasing profits as a speculative venture and also of maximizing feed yard space and facilities. This portion of the total number of cattle fed in commercial lots will probably always be a significant part of the industry and further declines will be gradual. Year to year fluctuations generally vary according to the availability of cattle to be custom fed and to the prospective future market conditions reflecting an opportunity for increased profits. Whereas some feed lots proclaimed a shift away from custom feeding and toward more self-ownership feeding, other lots of equal stature indicated a desire to expand the commercial aspect of the enterprise.

Rancher or Farmer. A more noticeable decline in the proportion of the total number of cattle finished in commercial lots owned by ranchers and farmers occurred from 1955 to 1957, the percentage dropping from 32.0 percent to 20.5 percent, with an average for the three year period of 26.1 percent. Cattle owned by this group are usually placed in a yard for further feeding because it is expected that they will make more profit than if sold at the time as feeders. Low feeder cattle prices in relation to fat cattle prices and even more so the anticipated future slaughter cattle prices tend to motivate more frequent use of a commercial feed yard by ranchers and farmers. Year to year fluctuations are therefore apt to be quite variable. Ordinarily lacking facilities and often times feeding know-how this group is prone to place cattle into a commercial yard if a desire for further finishing does exist.

Packer. An increase of 6.5 percent to 11.1 percent was revealed from 1955 to 1957 in the packers share of the total cattle fed in commercial feed lots with an average for the three year period of nine percent. Although accounting for only the second smallest proportion of the five categories of cattle ownership, packers could exert a significant influence on the future development of commercial cattle feeding, not in the extent to which it will progress necessarily, but rather the form, dependency, and internal structure that the industry takes on. This is discussed in the sections dealing with types of contractual agreements and implications of current trends in commercial feeding. Contrary to some feeder beliefs, the percentage of packer fed cattle has been on the increase in recent years. This study was unable to uncover the complete picture inasmuch as packer owned feed yards were not included. Year to year fluctuations in the proportion of packer fed cattle vary according to the current feeder cattle prices and the anticipated slaughter cattle supply. The main reasons why packers feed or have cattle fed are similar to the profit maximizing motive that stimulates others to feed. In addition to the speculative desire packers are able to insure a supply of the right kind of cattle throughout the year by their own or contracted feeding ventures. The resulting stabilizing effect is important in deriving full plant and labor utilization in the packing industry. It is apparent, therefore, that the packing industry can benefit from the commercial cattle feeding industry and the opposite also is true. Packer owned cattle fed in commercial feed yards have played a significant but thus far minor role in the extent of custom cattle feeding in Kansas.

Livestock Dealer. From 1955 to 1957 the livestock dealer's share of the total number of cattle fed in commercial lots increased from 18.9 percent to 28.7 percent with an average for the three year period of 24.1 percent. This group was the second major contributor to commercial feed lots in 1957. Dealers include commission men, traders, speculators, auction operators, and others engaged primarily in the buying and selling of livestock. As profit venturers, their motives for contracting cattle to be fed are in line with the other types of cattle owners but in addition they may find the services of a commercial feed lot convenient in holding over a drove of stale cattle or in short, feeding a load of grassers. The livestock dealer's role will likely continue to be of importance in commercial cattle feeding especially since the groups widespread contacts and knowledge of sources of feeder cattle effectively act as an intermediary solicitor of business.

Other Types of Cattle Owners. Accounting for the smallest proportion of cattle fed in commercial feed lots this group's share declined from 3.5 percent to 1.5 percent from 1955 to 1957 with an average for the three year period of 2.3 percent. This category includes such cattle owners as local businessmen, and research agencies (chemical, drug, and pharmaceutical companies, etc). The percentages indicated here were primarily attributed to drug companies experiment projects which removed the profit motive in cattle feeding per se as the reason cattle were placed in the lots. The proportion is insignificant and probably will always be quite small in relation to the whole.

ANALYSIS OF FEEDER CATTLE PROCUREMENT METHODS

General Comments

Kansas has traditionally been strategically located relative to the supply of feeder cattle as indicated by the superior position held by the Kansas City terminal livestock market in the number of stockers and feeders handled over the years as far back as 1925 in comparison with the other nine major markets (13). Stocker and feeder cattle movements from the Western and Southwestern ranges into the Great Plains grasslands have typically precedented the structure of the basic cattle production cycle. The Flint Hills' bluestem and the Plains' buffalo grasses have made Kansas an attractive site for preconditioning cattle for feed lot finishing. Enhanced with a more favorable supply of feed grains the state is becoming more and more adapted to cattle feeding by combining these two existing situations rather than to ship the two resources to other sections of the country to be fabricated.

Realizing the advantage, commercial cattle feeders stepped into the scene with a resultant early consideration of the various means of feeder cattle procurement. Before considering general comments related to self-owned and contracted cattle procurement methods a brief review of the transportation media used in cattle hauling will be presented.

A majority of the cattle shipments, both to and from commercial feed yards were made by truck in 1957 (Table 10). A number of the 16 feed lots indicated that a considerably different situation would have prevailed but a few years before, in favor of railroads. Four of the 16 lots received all of the cattle by truck and, as well, four shipped out all cattle by truck. No feed lot existed that at least some portion of the hauling was done by truck whereas three lots performed 100 percent of their hauling by truck. On particular lots where railroad facilities were convenient the bulk of the hauling was done by rail. In-transit rates for cattle to be fed are an advantage to distant shippers especially if the feed yard is located near a railroad. At least one lot owned its own truck line enabling readily accessible transportation when needed. A number of other lots had one or two trucks facilitating a portion of their own hauling. Several others depended on the services of local trucking agencies for all of their trucking needs. It is apparent that trucks, in general, have superceded railroads in the extent of cattle hauling and it is unlikely that the situation will reverse itself in the future.

Self-owned Cattle. For the three year period 1955-57 an average of 38.5 percent of the total number of cattle fed in commercial feed lots were self-owned, (i.e., the property of the feed lot owner or operator). It was not a

Table 10. Transportation methods used in receiving and shipping out cattle to and from commercial feed lots in Kansas, 1957.

Measurement	Percentage of cattle hauled			
	Receiving		Shipping out	
	Rail	Truck	Rail	Truck
Percent of Total	34.3	65.7	24.8	75.2

general practice for feed lot owners to purchase their own cattle from the same producers each year. In fact it was frowned on by several as being an undesirable policy inasmuch as the informal commitment that usually develops reduces the objectivity of the bargaining process each year. While the owner of the feeders sometimes place an ungrounded value on reserving the cattle, the buyer is less free to bargain aggressively if such a relationship exists. There were several instances, however, in which reputation owners were repatronized but relatively infrequently. All except two of the 16 purchased 100 percent of the feeders they finished for themselves. The remaining two purchased most of theirs also but had a cowherd from which a small portion of their own feeders were raised from calf-hood.

Influencing the number of self-owned cattle fed each year are such things as: Cost of feeders compared to the cost of fat cattle, cost of feed, operating margin, number of head earlier grazed, amount of money available, and the number of cattle placed in the lot by others. Conjecture of profit was the most frequently reported motive influencing the extent of self-owned feeding. Of equal importance to some was the necessity and value of attempting to maintain a relatively constant operating level which necessitates supplementing the degree of custom feeding with a balance of self-owned feeding. Two feeders made particular mention of the fact that they were more stimulated to feed when the price of feed was high than when there was an abundance of cheap feed. Half of the 16 feeders interviewed reported that they attempted to forecast future cattle prices, each concluding that his attempts of the past were successful most of the time. The eight that did not utilize their forecasting abilities in determining how many self-owned cattle to feed either depended on the general opinions of others or were influenced by existing conditions.

Certain personal preferences were indicated regarding sex, weight, grade, and breed of cattle fed. Five of the 16 preferred to feed steers, while six preferred heifers. The remaining five expressed no preference. Four of the five preferring steers were in the Eastern half of the state and reasoned that steers could be fed cheaper per pound of gain, were more readily available, sold higher, and in particular were free from the possibility of being bred as heifers often are. All of the six preferring heifers were located in the Western half of the state and reasoned that heifers gained quicker turning over faster in the feed lot, required less investment, were not apt to be bred if bought light enough, and finished at a more desirable weight hanging a lighter carcass that was preferred by western Kansas packer buyers. In addition, heifers could generally be bought significantly below steers and sold at a relatively slight discount. The paramount reason heifers were popular in the Western half of the state was because packer buyers operating in that area preferred them. It was noted that when heifers were placed in a feed lot they were usually given a sufficient dose of stilbestrol to abort any possible pregnancy.

An average weight range of from 550-647 pounds was reported as being preferred by the eight feeders indicating a weight range for heifers. Eight preferences revealed for feeder steers going into the feed lot ranged from

771 to 843 pounds. Those who desired lighter weights did so because of the better feed efficiency, and more popular finished weight. Feeders preferring heavier weights concluded that they had fewer disease and feeding problems, faster rate of gain, and shorter necessary feed period.

Seven of the 16 feeders preferred to handle medium to good grade feeder cattle, whereas eight desired to feed cattle grading from good to choice. Only one owner preferred feeding cattle in the common to medium grade range. Herefords, Angus, Shorthorns, and crossbreds all received one or two first place votes from among the 16 feeders but for the most part no preference was indicated. Most important was the value placed on beef character with no evidence of dairyness.

Contracted Cattle. Of the total number of cattle fed in commercial feed lots during the three year period 1955-57 an average of 61.5 percent were fed on a custom basis. In 1957, 73.9 percent of all contract fed cattle were placed in commercial feed yards by "old customers." It is apparent from this that contracting cattle to be fed has been accepted by those satisfied customers who have tried it. Feed lot owners or operators purchased 9.1 percent of the total number of contract fed cattle in 1957 for their customers. Eleven of the 16 lots provided this service to their customers.

Factors influencing the number of custom fed cattle placed in commercial feed yards each year are much the same as the reasons presented by feed lot owners in determining the extent of their self-owned feeding. Such things as; price of feeders relative to the price of fat cattle, future expected price of slaughter cattle, cost of feed, anticipated profit margin, lack of home feeding facilities, and the extent of cattle bought too high in dealers hands all influence the number of cattle to be custom fed. In addition, one yard feeding for a local feed mill and grain elevator owner is affected by the amount of salvage feed available at the owners mill. A down market resulting in trapped cattle would stimulate speculators so trapped to utilize commercial feed yard services. Basically, however, the proft motive underlies all others. When conditions present a favorable conjecture of profits or a possible means of minimizing losses, then greater numbers of feeders will move into commercial lots.

For the most part, no aggressive effort was made to solicit new business from within the commercial cattle feeding industry in Kansas. Various promotional media that were used to a limited extent included personal contacts, newspapers, magazines, leaflets, radio, and by word of mouth. Personal contacts were the most universally used method of advertising the existence of respective commercial feed lots, followed by the assumed but effective spread by word of mouth. Only two feed yards utilized newspaper ads, two frequented radio opportunities, and just three made public their feeding facilities through magazine ads. It will be noted that the three firms advertising in trade magazines and otherwise expressing a promotional effort together comprised 48 percent of the total number of cattle fed in commercial feed lots in 1957. That same year, however, those same three lots accounted for 62.7 percent of the number of cattle fed on a contract basis. It is readily observed that these aggressive lots received more than their proportional share of the custom fed cattle. Be it advertising or not is indeterminate. Nevertheless the relationship does exist. Once adequate facilities are established, they are more apt to be fully utilized only through effective and extensive promoting.

The reasons why farmers and ranchers do not feed at home are varied.

Inadequate facilities, labor shortages, and a lack of experience and feeding know-how in starting and finishing dry lot cattle are several of the main contributors to contracting rather than home feeding. The relatively small number of cattle fed by any one farmer or rancher usually does not warrant a heavy investment in equipment. It is generally well recognized that a commercial yard is more properly equipped to do the job cheaper and more conveniently.

Marketing Channels Used in Purchasing Feeder Cattle

In 1957 livestock auctions were the primary sources of self-owned feeder cattle purchases followed by personal at-the-ranch contacts, terminal markets, order buyers, and local dealers in that order (Table 11). Particularly in the Western half of the state were auctions most popular with 77.2 percent of the feeders purchased by this method being in that area. Of the total self-owned feeder cattle bought by the 16 lots, almost half, or 45.5 percent, were purchased at auction. The second most popular method of procurement was by personal at-the-ranch purchases which accounted for 29.5 percent of the total number of self-owned feeders bought. Eastern area feed lot owners comprised the bulk of this system of buying in that 74.7 percent of all feeders bought through personal purchases went to feed lots in the Eastern half of the state. Terminal markets accounted for 11.7 percent of the total number of self-owned feeders purchased by the 16 commercial lot owners and again were more popular in the Eastern than in the Western half of the state. Feed yards in eastern Kansas received 82.1 percent of the self-owned feeder cattle bought through terminal livestock markets. Order buyers were utilized for 7.9 percent of the self-owned feeder cattle purchases of which 80.2 percent

Table 11. Method of buying self-owned feeder cattle by commercial cattle feeders in Kansas, 1957.

Measurement	Percentage of cattle bought by method of purchase					Total
	Terminal	Auction	Personal at-the-ranch	Order buyer	Local dealer	
	%	%	%	%	%	%
Percent of total	11.7	45.5	29.5	7.9	5.4	100.0

were for Eastern area feed lot owners. The least important method of self-owned feeder cattle procurements was through local dealers which accounted for only 5.4 percent of the aggregate about equally distributed in the Eastern and Western sections of the state. Actually, only three feeders bought cattle from local dealers.

The total number of feeder cattle purchased by commercial feed lot owners for self-owned feeding purposes was about equally divided between the nine Western and seven Eastern area feed lots in 1957. Auction purchases of feeder cattle by the nine Western area feed lot owners alone accounted for 35.1 percent of the total in 1957. It is apparent that the extensive use of auctions by western Kansas feed lot owners more than offsets the various other means of feeder cattle procurement more commonly frequented by eastern Kansas feed lot owners with the net overall result that auctions dominate as sources of feeder cattle purchases.

State of Origin of Feeder Cattle

In the heart of the cattle grazing country and neighbor to the vast range lands of the West and Southwest, Kansas has not been troubled with an unreadily available supply of feeder cattle. Although local drouth conditions from time to time cause a temporary shifting in the abundance of feeders, a relatively strong supply is usually not too far removed from Kansas feed lots. Local conditions over the country may cause fluctuations in the relative importance various states may express at any given time, but in the long run the greatest number of feeders have in the past been provided by particular basic areas. Kansas pastures themselves have furnished a considerable number of cattle ready for feed lot finishing.

The determination of state of origin of feeders placed in Kansas commercial feed yards was limited to the final transaction, or from the site of purchase immediately preceding movement into the feed lot. This does not exclude the possibility of feeders actually originating in Texas, for example, purchased by a livestock dealer at auction there, selling them through the Oklahoma City terminal to a speculator who in turn may sell them to a Kansas order buyer after which they are finally delivered to the feed lot. In this case, Texas would not have been reported as the state of origin but instead Oklahoma or possibly even Kansas would have acclaimed the origin of the feeders. Although situations such as this undoubtedly would change the picture somewhat, it is not felt that any drastic difference in the percentages obtained from various states would prevail.

Dividing the types of feeders purchased into those self-owned and those custom fed, approximately half of the cattle fed in commercial feed lots originated in Kansas for both cases. The basic differences between the two types of feeders represented by ownership were that self-owned cattle originated over a wider area coming from more different states, and that Texas and Oklahoma were represented by a significantly smaller proportion furnished of self-owned feeders as compared to custom fed cattle. For both types in 1956 and 1957, Oklahoma was the second and Texas the third most important state contributing feeder cattle to commercial feed lots in Kansas (Table 12).

Table 12. State of origin of self-owned and custom fed feeder cattle placed in commercial feed lots in Kansas, 1956-57.

State	Proportion originating in various states			
	Self-owned		Custom fed	
	1956	1957	1956	1957
	%	%	%	%
Kansas	48.9	49.0	45.8	50.9
Oklahoma	19.3	12.7	27.0	21.8
Texas	18.1	11.3	20.6	20.6
Colorado	7.5	3.5	4.3	4.4
Arkansas	0.3	7.8	1.0	1.0
Louisiana	0.4	6.8	1.0	1.0
Nebraska	1.7	1.7	0.1	0.1
New Mexico	1.9	1.7	0.2	0.2
Tennessee	0.1	1.9	-	-
Mississippi	0.1	1.9	-	-
Wyoming	1.6	1.6	-	-
Missouri	0.1	0.1	-	-
Total	100.0	100.0	100.0	100.0

FEEDING AND OPERATIONAL PRACTICES

Description and Evaluation of Contracts and Types of Agreements

A diversified variety of feeding arrangements were found to exist. The contracts differed to some degree among each of the 16 feed lots but did tend to exhibit certain characteristics from which a number of generalizations could be made.

Basically, there were two main types of contractual agreements: (a) Yardage charge ranging from five to 10 cents per head per day plus feed handling and processing price mark-up, or (b) charge per pound of gain from entry into the yard until departure. The first of these had more common usage in 1957 than did the latter. One other plan, although used by only one of the 16 feed yards, is worthy of brief mention; namely, a straight tonnage feed price mark-up. The rate of mark-up was not determined but undoubtedly it was flexible.

The yardage charge plus feed price mark-up type being the most popular was utilized by 13 of the 16 feed lots. It, too, was capable of flexibility within itself. This was possible by varying yardage charge rates as well as through a processing and handling charge mark-up on feed where feed processing facilities were an intricate part of the enterprise as was the case on 14 of the 16 feed lots.

Yardage charge rates varied from five to 10 cents per head per day in the state. Of the seven feed lots in the Eastern half of the state, six utilized the yardage charge plus feed cost system. Four of the six lots charged yardage rates ranging from seven to 10 cents per head per day, the other two charging from five to 10 cents per head per day depending upon the the individual fed for.

Of the nine feed lots in the Western half of the state, seven utilized the yardage charge plus feed cost system. All seven reported yardage charge rates of five cents per head per day.

Based only upon yardage charge rates the owner of cattle does not have sufficient evidence to merit a conclusive comparison of his expected costs between various feed yards. Disregarding the ability, reputation and location of the feed yard as well as other important factors, it remains necessary to investigate the other flexible portion of this type contract, namely feed costs, in order for him to obtain a representative picture of his expected daily costs.

Processing and handling charges added to the feed costs undoubtedly account for a significant portion of the profits on some lots. Eleven of the 13 feed lots utilizing the yardage charge plus feed cost type of agreement had available their own feed processing equipment each doing 100 percent of the necessary feed milling and mixing. The remaining two utilized the services of a local cooperative feed mill thereby realizing some savings in the form of co-op dividends.

Of those revealing specific price mark-ups on feed, typical rates were found to be; 10 to 20 cents per hundredweight on grain, $2.00 per ton on protein, and one feed lot reported $2.50 per ton on hay.

The foregoing discussion of the yardage charge plus feed cost type of basic contractual agreement indicates its flexible nature as well as its current popularity on Kansas feed lots. It is estimated that approximately 90 percent of all contract fed cattle in the state were finished under some modified form of this type agreement in 1957.

The second major basic type of arrangement is a cost per pound of gain from entry into the yard until departure. The bulk of the remaining 10 percent of Kansas contract fed cattle were fed on this basis. The plan was found to be especially popular with some packers who had cattle fed commercially.

Six of the 16 feed lots reported the feeding of some cattle under this system. Only one of the six, however, used this type of contract exclusively, the remaining five offered the yardage charge plus feed cost as well. Certain packers demanded the cost per pound of gain arrangement which accounted for most of its frequency of occurrence, limited as it was. Under this method it is particularly important to have a predetermined understanding regarding the time and manner of weighing in and out of the yard. Generally, the catle are weighed in at the feed yard as they are unloaded and weighed out at early morning with an added four percent pencil shrink.

The margin of profit being figured into the feed prices makes it imperative under this system for the feed lot operator to exercise particular care in feeding. Since his profit is directly determined and proportional to the efficiency of gain, he is confronted with an incentive to produce efficiently. This basic difference from the first type of contract is not without merit even for the feed lot operator since it displays not only an equitable arrangement for both sides but also a great potential selling point in promoting the yard.

During the fall of 1958 cattle fed on a charge per pound of gain basis indicated these typical feed yard charges: Steers - 23 to 25 cents per pound of gain, heifers - 22 cents per pound of gain. These rates do not necessarily apply to all ages, weights, and grades of cattle. It is assumed that specific rates applied to a given lot of cattle would depend on these factors since cost per pound of gain does vary according to age, weight, and degree of finish. Therefore, 23 to 25 cents per pound of gain for steers may apply only to yearlings weighing 800 - 1,100 pounds and fed up to the average choice grade. These same rates would not be appropriate for taking the same cattle to the prime grade, weighing 1,350 pounds.

In most instances cattle fed on this basis were placed into the lot under a written contract, whereas those fed for farmers, ranchers, and livestock dealers on a yardage charge plus feed cost basis did not make use of a written agreement. Fifteen of the 16 feed lots had no written contract except for packer fed cattle which were on a charge per pound of gain basis. In certain other cases some feeders maintained written contracts for parties unknown to them.

On each of the 16 feed lots death losses were absorbed by the owner of the cattle. In some cases the yardage charge to date of death was cancelled or where the feed lot operator was directly responsible he may have verbally agreed to stand part or all of the loss.

The general exception to the owner of the cattle standing the death loss was in the case of cattle fed for some packers. Under the packers written contract the feed lot operator and the packer divided evenly the cost of the feed, medicine, and original value of the dead animal.

Very few of the feed lot owners provided insurance on the cattle being fed. Only four of the 16 carried any formal cattle insurance at all, two of which were merely on their self-owned cattle, and one of the other two only on cattle under cover. The remaining one, which was one of the two large corporation owned lots, provided fire and extended coverage to all of the cattle fed. In addition, the other large corporation owned feed yard was organized such that a claims department could make necessary settlements. Eleven feed lots therefore carried no insurance either on their own cattle or on custom fed cattle. In any event, the contracted cattle owners could, of course, insure their own cattle at their own expense, the extent of which was not ascertained. It probably amounted to a small portion of the total, however.

Listed are three typical commercial cattle feeding arrangements found to exist in the fall of 1958:

1. No written contract (unless on a gain basis). Cattle over 550 pounds charged eight cents per head per day plus feed costs. Cattle under 550 pounds charged seven cents per head per day plus feed costs.

2. No written contract with local farmers. Charge is five cents per head per day plus feed costs (also dividend from local cooperative feed mill). Packer cattle are on a cost per pound of gain basis with heifers at 22 cents and steers at 23-24 cents per pound of gain. A morning weigh out with four percent pencil shrink is used.
3. No written contract. Charge is five cents per head per day yardage plus feed cost and mark-up (grain equals 20 cents per hundredweight rolled and fed, protein equals $2.00 per ton, hay equals $2.50 per ton).

Size of Lot and Capacity Utilization

Utilizing an average of about 60 acres per lot for pens and buildings the 16 feed yards ranged in size from five to 240 acres. Ten had at least 20 acres in pens and buildings while four had over 100 acres.

Feed yard capacity was defined as the number of cattle that can be fed at any one time. Depending on the size and weight of cattle, the capacities reported would therefore vary somewhat from time to time. It is assumed, however, that the variety of cattle handled on any given lot would represent a typical array including portions of various sizes of cattle. Rate of turnover per year is therefore the total number of cattle fed per year, divided by the feed lot capacity. In 1957, the rate of turnover for the 16 commercial lots combined, averaged 1.8 times.

Ranging from 600 to 15,000 head of total feed yard capacity the 16 lots averaged approximately 5,200 head. Eight feed lots had a total capacity of less than 5,000 head, three between 5,000 and 10,000 head, and five could feed more than 10,000 head of cattle at any one time.

Combining the acreage devoted to pens and buildings with the average total feed yard capacity it was found that roughly 88 head of cattle, on the average, could occupy each acre of commercial feed lot space if all 16 yards were operating at capacity. It would be reasonable to assume that from 70 to 110 head per acre of pens and buildings could be used as an estimator in determining the number of acres needed to establish a given scale of operation. The number would, of course, depend on the size of cattle to be fed. Application of this generalization may be used in estimating the cost of starting a commercial feed lot as it is used in a forthcoming section of this thesis dealing with that subject.

Regarding the number and cattle holding capacity of the pens it was found that covered pens existed on four of the 16 feed lots. Where covered pens did occur they were not regarded to be as desirable as open pens and they were not used as extensively as the outdoor pens on the same lot. The four mentioned, however, had an average of 38 covered pens per lot, each with a mean cattle holding capacity of about 42 head. The average number of outside pens for the 16 lots was approximately 30 pens per feed yard with a range of from six to 70 pens per yard. The calculated mean cattle holding capacity per outside pen was around 156 head. The foregoing relationships are compiled in Table 13.

The level of capacity at which the 16 feed lots operated varied from 46.2 percent in the summer to 82.2 percent in the fall (Fig. 4). It would be expected that in the summer months of June, July, and August the traditional cattle production technique of witholding stockers and feeders from the dry lot so as to fully utilize all available pastures would reduce the

Table 13. Size of lot, number of pens, and cattle holding capacity of commercial feed yards in Kansas, 1958.

Measurement	Acreage for pens and building	Feed yard cattle holding capacity	Capacity per acre	Outside pens No. per feed yard	Outside pens Capacity per pen	Undercover pens (where existing) No. per feed yard	Undercover pens (where existing) Capacity per pen
	(acres)	(head)	(head)		(head)		(head)
Average number	59.5	5,206	87.5	29.9	155.6	38	41.5

extent of commercial feeding. One of the economic goals of the efficient feed lots, however, is to maximize feed yard capacity throughout the year. The complacent attitude of some feed lot operators with regard to operating at capacity during this slack period could beneficially be replaced with a more aggressive desire and effort to fill their lots with cattle that could be finished and ready for market before the seasonal fat cattle prices drop off. A more uniform supply of slaughter cattle over the year would eventually result in more stable seasonal prices thereby taking some of the risk out of cattle feeding. It is anticipated that commercial cattle feeding will contribute toward accomplishing this goal.

Only two of the lots reported having operated at full capacity during each of the fall, winter, and spring seasons in 1957. Two others operated at 100 percent capacity only in the fall and winter. In all, five of the 16 lots fully utilized their facilities only during the fall season. One feed yard utilized only one-tenth of its potential capacity in the summer and utilized a mere 25 percent of its investment in feed yard and equipment the remainder of the year. Undoubtedly this least efficient commercial feed lot in the state stems from the fact that it is also the least aggressive.

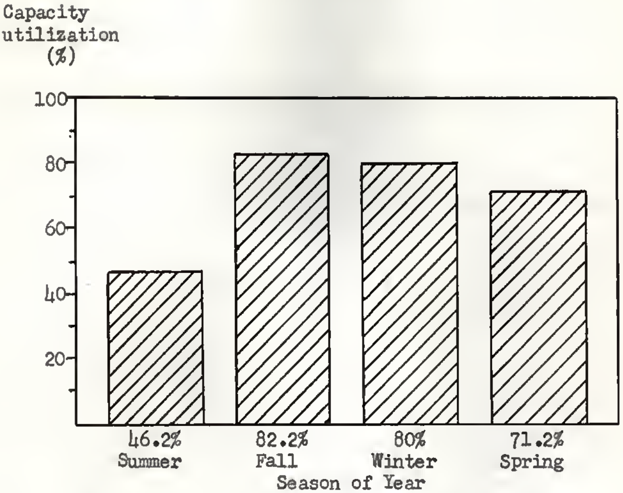

Fig. 4. Level of operation in commercial cattle feed lots in Kansas, by seasons, 1957.

Half of the 16 feeders interviewed did not believe they had yet reached an optimum or maximum size operation. The other eight concluded that expansion possibilities on their particular lots had already been fully exploited. Two of the latter groups were limited by land restrictions since they were situated on the immediate edge of sizeable towns. Those who indicated a desire and capability for further expansion quoted arbitrary feed lot capacity figures ranging from 3,000 to 18,000 head depending on their surrounding conditions and personal fancies. A maximum or optimum size feed lot can be ascertained only through a detailed economies of scale study. Such a study was not a part of this thesis.

Factors that limit the size of particular feeding operations are such things as; finances, competent labor, qualified management, roughage supply, grain supply, cattle supply, number of customers, and ambition. All were reported by some feeders.

Crop Production

Seven of the 16 lots integrated a farming operation with the feeding enterprise such that 4.6 percent of the grain, 54.8 percent of the silage, and 18.8 percent of the hay fed in 1957, on the average, for the seven lots concerned was raised on their own or leased crop land. Five of the seven provided a portion of their own grain supply, all seven raised some silage, and six of the seven cropped some land for a portion of the hay fed. Totsl cropped acrés ranged from 400 to 2,000 acres per lot with a mean acreage of 1,111 for each of the seven crop integrated feed yards.

Measured for the states commercial cattle feeding industry as a whole the 16 feed lots were provided with 3.1 percent of the grain, 37.3 percent of the silage, and 12.8 percent of the hay fed in 1957 from home grown supplies. The 16 feed lots possessed an average of 486 acres of self-owned or leased crop land. Actually, however, nine of the yards purchased all of their own needed feed supplies. One of the major advantages of a crop integrated feed lot is dealt with in a subsequent section devoted to the manure disposal problem.

Feed Handling Facilities and Techniques Used

One of the most important single functions of a commercial cattle feed yard is the procurement, processing, mixing, and feeding of grains and roughage. A feed yard filled with cattle is confronted with the absolute necessity of providing sufficient feed stuffs in the proper proportions so as to enable maximum feed efficiency and rate of gain. To accomplish this purpose the yard must either possess adeqiate feed storage and processing facilities, or it must have pre-arranged access to a guaranteed supply of feed. In addition to necessary physical equipment it is also imperative that the feed lot operator have a keen knowledge of nutrition and cattle feeding techniques, a matter discussed somewhat in the next two sections.

With regard to physical feed handling facilities it may be generally concluded that most commercial feed yards depend primarily on their own feed processing plant and equipment. Thirteen of the 16 lots performed all of their necessary feed milling and mixing, and had ample feed storage space to enable bulk purchases for assured future needs. One of the other three was able to grind and mix about half but could store about a two months supply of bulk grain. The remaining two did none of their own feed milling but rather utilized the services of a local cooperative feed mill which enabled them to realize some co-op dividends. These two, however, did their own mixing either in automatic wagons or with a tractor scoop.

Half of the lots used mixing wagons or trucks while the other eight mixed the feed ingredients at their own mill. Where mixing vehicles were used they were either of the type that enabled mixing in transit to the pens or that mixed the feed as it was discharged into the bunks. In almost all cases feed additives, where used, were included in the protein by a commercial feed company.

Various size feed mills ranged in capacity from 200 to 1,000 bushels per hour. Five of the 13 yards possessing feed processing facilities either had a financial interest in or operated also as the local feed mill with one being a relatively large grain elevator as well. Excluding the three million bushel grain elevators storage capacity, the other lots' bulk grain storage space ranged from 9,000 bushels to 290,000 bushels with 10 of the lots capable of storing over 20,000 bushels of bulk grain.

Sack feed storage facilities were available on all of the lots but little used on most of them. Actual capacities varied from 30 to 450 tons. The greater efficiency derived from bulk grain handling and purchasing has led most feeders to avoid sack feed, wherever possible.

Bulk purchasing is particularly an advantage where no other special feed procurement facilities are utilized. Western Kansas feed lots obtained a considerable portion of their grain supply from locally produced milo sources. Most eastern Kansas feeders shipped in either corn from the North or milo from the West depending on the relative prices of the two feed grains. Future booking with grain agencies and future contracting with grain growers was generally practiced. The least aggressive of the 16 feed lots merely made grain purchases as needed at the going current market price. With storage space available most other feeders realized the value of making harvest season purchases. Silage, where used, was usually obtained solely from immediate local sources, whereas hay was either locally produced or shipped in depending on the climatic conditions from year to year. None of the 16 lots were tied in contractually with any commercial feed companies, although opportunities to do so were expressed. Uncommitted to any particular feed company, most of the lots purchased various selected brands more than others for protein requirements, depending on relative prices and personal preferences. Several feed lot owners were, however, agents for particular commercial feed companies and as such found no difficulty in choosing from among the many.

The Ration

Accomplishing the goal of most economic feed efficiency and rate of gain separates the successful feed lot operators from the losers. This task is dependent upon the nutritional knowledge, feeding experience and knowledge of costs. Fulfilling the objective is best reflected in the ration used and the manner in which it is fed. Properly starting the cattle and developing a level of full feeding as well as maximising consumption throughout the remainder of the feeding period do not alone accomplish the goal. The correct combination of feed stuffs is equally as important, for an unbalanced ration consumed in vast quantities is ineffective in maximizing feed efficiency or rate of gain.

As would be expected, no two identical rations were found to exist on the various feed lots but rather each exhibited its own distinct personal touch. Although various ingredients were combined in different ways, all of the rations were basically similar at the full feed level in that they contained from 75 to 85 percent concentrate and from 15 to 25 percent bulk. This physical balance is in accordance with the optimum concentrate bulk ratios of 5:1 for short feeding periods and 3:1 for long feeding periods found by Keating in 1954 (4). Actually the upper limit of 85 percent concentrate and 15 percent bulk reported by at least one feeder exceeds the optimum range but only slightly (5.67:1 as compared to 5:1).

Generally the composition and amount fed of the rations used were approximately in line with the basic thumb rule that feed lot cattle will consume about three percent of their body weight per day of feed measured on a dry weight basis. Breaking this amount down further into three major components it may be roughly estimated that about two percent of the body weight will be consumed of grain, one percent of roughage, and 0.2 percent of protein.

The grain portion of the rations fed in commercial feed lots in Kansas was made up chiefly of either ground milo or corn, whichever was the cheaper or most accessible, with six lots using some barley, and two relying partly on ground millet to provide the carbohydrates. Molasses was fed in four of the feed lots. The roughage or bulk segment of the ration usually took the form of either ensilage, ground alfalfa, or prairie hay with bran fed in two lots and cottonseed hulls used in three others. Less commonly utilized as roughages were dehydrated corn cobs and wheat hay. Either sorghum or corn silage was fed in half of the lots, in some cases merely to start the cattle or during the early phase of the feeding period while other cases throughout the entire feeding period. Commercial protein supplement mixtures were used in eight yards with others furnishing the protein in the form of cottonseed or soybean meal.

Three typical daily rations at a level of full feeding that represent eastern and western Kansas commercial cattle feed lots follow:

1. Sorghum silage, 20 pounds or more; prairie hay, free access from racks, 2 pounds or more; corn, 7 pounds; milo, 7 pounds; barley, 6 pounds; commercial protein supplement, 2 pounds. For 1,000 pound two year olds.
2. Sorghum silage, 10 pounds; ground alfalfa hay, 1.5 pounds; milo, 15 pounds; molasses, 1 pound; commercial protein supplement, 1 pound. For 750 pound cattle.
3. Corn silage, 10 pounds; milo, 6 pounds; corn, 3 pounds; barley, 2 pounds; millet, 1 pound; cottonseed meal, 1 - 1.5 pounds.

For 600 pound cattle.

With the exception of the first ration which may be deficient in Vitamin A as it stands, the three representative rations basically conform to Morrison's feeding standards (1). Selected recommended rations from that source that could be used in Kansas feed lots are listed below for three different weight classes of cattle. They indicate the amounts that should be fed per head per day. Substitution of various feed stuffs according to relative prices is desirable in order to reach an economical combination of ingredients. All of the listed rations are regarded as being at a level of full feed. Protein supplements contain the most common level of digestible protein: Cottonseed meal, 41 percent; linseed meal, 34 percent; soybean oil meal, 44 percent. It will be noted that when grain sorghums replace yellow corn, allowance must be made for supplying sufficient carotene (Vitamin A) from some other source such as alfalfa or other legume hay or in the form of Vitamin A supplement.

Calves being fattened for baby beef, average weight 600 pounds.

1. Corn or sorghum silage, 10 pounds or more; alfalfa or other legume hay, two pounds or more; corn or ground grain sorghum, 10 pounds; soybean oil meal, linseed meal, cottonseed meal, or other high-protein supplement, 1.25 to 1.5 pounds.
2. Clover-timothy hay (containing 30 percent or more clover), four to five pounds; corn or ground grain sorghum, 11 pounds; cottonseed meal; soybean oil meal, or other high-protein supplement, 1.5 pounds.
3. Corn or sorghum silage, 16 pounds; corn or ground grain sorghum, 10 pounds; cottonseed meal, soybean meal, or other high-protein supplement, 1.5 to 2 pounds; ground lime-stone, 0.1 pounds.

Fattening yearling cattle, average weight 900 pounds.

1. Corn or sorghum silage, 15 pounds; alfalfa or other legume hay, three pounds; corn or ground grain sorghum, 13 pounds; linseed meal, cottonseed meal, or other high-protein supplement, 1 pound.
2. Clover-timothy hay (containing 30 percent or more clover), six to eight pounds; corn or ground grain sorghum, 13 pounds; soybean oil meal, linseed meal, cottonseed meal, or other high protein

supplement, 1 to 1.25 pounds.

3. Corn or sorghum silage, 20 pounds; corn or ground grain sorghum, 13 pounds; high protein supplement, 1.5 to 1.75 pounds; ground limestone, 0.1 pound.

Fattening two-year old cattle, weight 1,000 pounds.

1. Corn or sorghum silage, 25 pounds; alfalfa, soybean, or cowpea hay, 4 pounds; corn or ground grain sorghum, 14 pounds. Adding 0.5 pound high-protein supplement will increase the rate of gain slightly and may be profitable. The supplement should be added if less legume is fed.

2. Clover-timothy hay (containing 30 percent or more clover), 10 pounds; corn or ground grain sorghum, 14 pounds; soybean oilmeal or other high-protein supplement, 1.0 pound.

3. Corn or sorghum silage, 30 pounds; corn or ground grain sorghum, 14 pounds; linseed meal or other high-protein supplement, 1.5 pounds; ground limestone, 0.1 pound.

None of the 16 feeders revealed any significant changes made in the basic ration in the last several years. Minor changes indicated were from cottonseed hulls to silage for bulk, and from meal as a protein to a commercial protein mix in one instance. Numerous cases, however, reported initiating the use of stilbestrol in recent years, whereas one switched from feeding stilbestrol to implanting it.

Each of the 16 yards used stilbestrol to increase feed efficiency and rate of gain. Only two reported using implants, the remaining 14 mixed it in with the ration and fed it at a level of from five to 10 milligrams per head per day. Where implants were used, it was felt by the operators that they were equally as effective and considerably more economical as compared to feeding the hormone. All feeders were convinced that its use stimulated the gaining ability of the cattle. Only two, however, had verifying empirical data from their own tests to back up their beliefs. One of these claimed added daily gains of 0.4 pound for steers and 0.25 pound for heifers whereas the other feeder stated 10 percent more gains for steers and seven to eight percent added gains for heifers.

Other additives included in some or all rations were: Minerals, salt, systemics, aureomycin, and Vitamin A. On feed lots where milo replaced corn as the carbohydrate Vitamin A supplement was necessarily added. Nine of the feed yards made use of aureomycin either occasionally or consistently. In many of these cases it was merely used to start the cattle or on lighter-weight cattle. Where used it was concluded by the operators that the antibiotic effectively reduced pneumonia and other disease problems early in the feeding period. The use of tranquilizers appeared in only one feed yard, and there only in an experimental test on cattle belonging to a chemical company. The results of that experiment were reported to be inconsistent.

Feed Conversion, Rate of Gain, and the Feeding Margin

How well the goal of maximizing feed efficiency and rate of gain has been accomplished is reflected only in the actual observations of these two important criteria of determining technical efficiency. It was surprising to discover that 11 of the 16 commercial feed yards had made no attempt to determine feed efficiency. The other five reported their estimated feed conversion ratios but it was apparent that tests were actually conducted in only three of the five lots. This means that only three commercial lots in the state could provide potential customers with empirical data that would indicate approximately the feeding efficiency of the yard. It also means that the feed lot operator himself was at a loss to determine with certainty the effectiveness of his rations and feeding techniques where this information was not known. On the few lots where feed conversion ratios were known, figures ranged from 7.5 @ 9:1 for 600 pound steers, 7.5 @ 9.5:1 for 800 pound steers, and 8.5 @ 11:1 for 1,000 pound steers. For heifers the reported ratios varied from 8 : 9:1 for 600 pound weights, and from 8.5 @ 9:1 for 800 pound heifers. Actually these data are quite limited and would be more useful expressed as ratios of total digestible nutrients required per hundred pounds of gain.

Regarding average daily rates of gain almost all feeders had either tested various lots or reported estimated figures. Those who quoted figures sometimes selected exceptionally well-doing lots. Nevertheless rates of gain reported ranged from two to three pounds per day for 600 pound steers, from 2.5 to 3.25 pounds per day for 800 pound steers, and from 2.3 to 2.8 pounds for 800 pound heifers. These rates do not represent over-all average daily rates of gain but rather are selected test lots or approximations by the feeders interviewed. In certain instances they are presumed to have been exaggerated estimates.

Nutritional studies have shown that rate of gain is highly correlated with economy of gain. Faster gaining cattle require less feed per 100 pounds of gain than do cattle that are slower to put on weight. Since heredity plays a significant role in both feed efficiency and gaining ability it would be expected that two different lots of cattle fed in the same feed yard may well exhibit different performance records. It is therefore only possible for the feed lot operator to maximize the inherent gaining ability and feeding efficiency. Generally, the profits or losses incurred from feeding cattle are actually more closely associated with the margin from the standpoint of the cattle owner.

The margin is the difference between the cost per hundredweight of feeder cattle and their selling price as fat cattle. The necessary margin refers to the particular margin needed for a lot of cattle in order that all expenses will just be covered, or that no losses are incurred. Necessary margin may also be referred to as the break-even margin.

Various factors influence the necessary margin, the most important single one being the cost of feed since it is the major contributor to the cost of gains. Generally it costs more to put 100 pounds on feeders than they will bring per hundredweight as fat cattle. This means that in order to avoid loss usually a greater price per 100 pounds must be realized from the finished cattle than was paid for the feeders to make up the difference.

In the fall of 1958 conditions were such that no positive margin was needed to break-even. That is, cost of gains did not exceed prices received for fat cattle (22-24 cents per pound of gain as compared to 24-25 cents per pound of finished cattle); therefore, feeders purchased earlier at 24.50 to 26 cents per pound had little difference to make up. To illustrate the situation at that time, assume a 700 pound feeder steer costing $25 per hundredweight was placed in the yard for fattening in July, 1958. The total initial cost would have been $175. Average total cost per 100 pounds of gain was $23, which when applied to 180 pounds of gain assuming two pounds per day for 90 days would have resulted in a total feed cost of $41.40, for the three month period. The over-all cost of the finished steer going out of the feed lot in September, therefore, was $216.40. Dividing the over-all cost by the final weight of 880 pounds gives the necessary selling price of $24.59 per hundredweight. To obtain the necessary or break-even margin simply observe the difference between the feeder steer cost ($25 per hundredweight) and the finished steer selling price ($24.59 per hundredweight). In this case there is no positive margin, but rather a negative one of 41 cents, a situation quite favorable for feeding cattle.

In addition to feed costs other factors also affect the necessary margin in cattle feeding. A long feeding period and large total amount of gain, excessively large marketing expenses, light weight feeders, and relatively low initial cost of the feeders all tend to widen the necessary margin. When the opposite conditions prevail, accompanied by low-cost gains, the break-even margin becomes smaller.

Normally cattle were kept on feed from 90 to 120 days on the average for the 16 feed lots. Five lots reported short feeding periods of less than 90 days as a rule, whereas the remaining 11 generally fed the cattle over 90 days. Four of the five short-feed yards marketed more good grade slaughter cattle from their lots than other grades whereas the other one sold more cattle as choice than other grades following in part from indicated preferences of medium to good grade feeders in the former case and of good to choice grade feeders in the second case. Seven of the 11 longer-feed yards marketed mostly choice grade slaughter cattle. The other four moved primarily good grade cattle from their yards but indicated a preference for feeding medium to good grade feeder cattle. There was a definite relationship observed on the various lots between the average number of days fed, the grade preference of feeder cattle, and the finished grade of the slaughter cattle.

Half of the 16 feed lots marketed mostly choice grade fat cattle while the other eight finished mostly good grade slaughter cattle. For the commercial feed lot industry as a whole in Kansas, 48.5 percent of the cattle fed were marketed at the choice grade while 40 percent were sold as good grade slaughter cattle in 1957. This matter is taken up in more detail in the section dealing with slaughter cattle disposition methods.

Manure Disposal

The potential value of manure as a land restorer has apparently not been appreciated by Kansas crop farmers. Nor has its importance as a by-product of cattle feeding been fully realized by commercial feed yard operators. This fact was convincingly impressed upon the author when it was discovered that only seven of the 16 feed yards could legitimately claim manure as an asset to the enterprise. On five other lots manure was actually a liability whereas on the remaining four it was considered as neither a credit nor a liability but rather was a necessary evil that contributed or detracted nothing from the profits of the enterprise.

The situation arose from the fact that demand for manure by Kansas crop producers was virtually non-existant. Lack of demand for this valuable resource apparently stems from tradition and unfamiliarity of the potential benefits that could be derived by using manure on depleted soils.

Although it may be true that nitrogen, phosphorous, and potassium sources are relatively low, percentagewise in manure, it cannot be denied that as a humus and minor element provider manure is economically unexcelled where its supply is in abundance and its transporting and handling costs may be kept at a minimum. If the composition of manure coming out of the lot is approximately 0.5 percent nitrogen (N), 0.25 percent phosporous (P_2O_5), and 0.5 percent potassium (K_2O) then the total nutrient content of wet manure would be about 1.25 percent. Applying hypothetical but approximate prices to the quantities of elements contained in a ton of manure it is found to be worth about $1.95 per ton: Nitrogen, 10 pounds at 10 cents per pound equals $1.00; plus, phosphorous, 5 pounds at 9 cents per pound equals 45 cents; plus, potassium, 10 pounds at 5 cents per pound equals 50 cents. Under these conditions, as long as the cost of hauling a ton of manure does not exceed its $1.95 value per ton it pays to haul it. No measure of the minor element and organic matter content of manure is given here, however, on some soils this portion is particularly needed and exceptionally beneficial when applied.

It may generally be concluded that manure applications are practical and economical particularly on irrigated land, eroded or levelled land that is lacking in humus, and on soils afflicted by excess salt or alkali deposits. Spots with poor drainage are usually improved by manure applications that will enable the proper soil texture and organic matter content to be restored.

Although commercial fertilizer is more conveniently handled and cannot be replaced by manure alone, it may be profitably complemented by simultaneously using manure. Commercial feed yard operators need to promote this idea in their surrounding area to remove manure production from the liability or no-account side of their ledgers.

It would not be unfeasible to assess a value of $1.00 per head in manure production credit for all cattle fed in Kansas feed yards. One feeder believed this to be true in his own case, however, most others would probably hesitate to accept it in the light of 1958 conditions.

Alternative outlets for manure produced in commercial feed lots are basically four in number.

1. Where a crop production or farming operation is integrated with the feeding enterprise manure has a ready outlet on leased or self-owned crop land. Only under these conditions was manure truly valued as an asset and fully utilized as such. This was possible on seven of

the 16 feed lots. Because manure disposal was generally a problem in commercial cattle feeding in 1958 a cropping operation was in part justified by enabling complete utilization of manure produced in the feed yard.

2. The next best alternative use reported was giving it to local grain and ensilage producers for application on the land cropped for feed production to be bought back by the particular feed yard. Disposing of manure in this manner yields an indirect return to the feed lot operator in the form of higher yielding acres of superior analyzing feed. Nutriente contained in manure are thus able to be brought back to the feed yard in part.

3. Selling manure to farmers was practiced by at least four feed yards whereas giving it away for the hauling was the arrangement of several others. In either case, the revenue received no more than offset the cost to the feed lot operator of loading and hauling. In these cases manure production was neither an asset nor a serious liability and as such, contributed nothing or detracted little from the profits. Every effort should be made to correct such a situation by promoting the value of manure.

4. The most enterprising method of escape from the manure production problem was discovered in the immediate area of the heaviest concentration of commercial feed yards where it was proposed to further consider the possibility of erecting a manure dehydrating plant. Commercial dehydrated manure production and sale may be the answer for those feed yards in converting a necessary and valuable by-product of the commercial cattle feeding industry from a liability to an asset. To

be sure, additional management problems would likely arise with the development of the newly integrated enterprise, however, the plan is worthy of further investigation and consideration. This possibility clearly illustrates the manner in which an industry becomes integrated. Complementary or supplementary enterprises, when combined, are intended to more completely utilize various resources.

Co-Existence of Hog Feeding

An enterprise that has traditionally been associated with the cattle feeding industry, and still is in the corn belt area, is the feeding of hogs. Not only have hogs been able to salvage undigested feed in cattle manure, but they have also been useful in feed lots to utilize wet and other waste feed.

Commercial feed lot operators in Kansas generally were not in favor of a hog-integrated cattle feed lot as indicated by 11 of the 16 yards owning no hogs at all in 1958. Several of the 11 had previously attempted small scale hog operations but due to unfavorable results, were currently against the practice of running hogs with the cattle. The five feed yards that did own hogs were not all in favor of allowing them to run with the cattle. In fact only two of the five allowed them to follow cattle in feed lots, one of these restricting the practice only to his self-owned cattle. In 1958, therefore, only one commercial cattle feed yard in the state permitted hogs to follow all cattle in the feed lot, custom-fed as well as self-owned.

The three yards owning hogs but not running them with the cattle were able to realize the benefit of a ready outlet for wet and otherwise waste feed from the cattle enterprise. Two of the three were in the process of developing a sow herd and were intending to farrow, raise, feed and market finished hogs as a separate yet integrated function of the feed yard.

General comments made regarding the co-existence of hog feeding with cattle feeding by those who did not favor the practice of running hogs behind cattle were; increased feed digestibility results in very little feed value left in the manure, hogs disturb cattle in a feed lot and tend to inhibit their rate of gain, hogs are a general nuisance around a feed lot in that they get in the feed bunks and require special tight fencing, and the fact that custom fed cattle should not be exploited by self-owned hogs.

The practice of following commercially fed cattle with hogs cannot be generally recommended in view of the foregoing reasons some of which are firmly grounded. Primarily, it is felt that allowing hogs to run with custom fed cattle is in conflict with and tends to inhibit the goal of a commercial cattle feeder, namely to obtain the most economical feed efficiency and rates of gain on cattle owned by outside interests.

The possibility of establishing a separate yet integrated sow herd with the cattle enterprise, as two feed yards are doing, should not be underestimated by existing and potential feed lot operators. These two livestock enterprises definitely are complementary and together they can accomplish much that alone they could not. One such example is labor utilization.

Labor Utilization

Aside from feed costs labor expenditures are usually the next most significant source of cash outlay in the commercial cattle feeding industry. How fully that labor is utilized may well determine the profit or loss of a particular firm.

The 16 feed lots had an average requirement of about eight full time laborers per lot with the various lots ranging in labor needs from one to 40 workers in addition to the feed lot operator himself. Furthermore, 12 of the yards had occasion to employ an average of about four part time laborers per lot during the year with particular needs varying from one to 20 workers.

Labor efficiency was not determined in this study, however, general observations among the various feed lots enable the inclusion of certain factors that influence labor utilization in the commecial cattle feeding industry. Basically, management governs the degree of labor utilization. Where qualified management exists competent labor usually is found. When specific responsibilities are vested in particular laborers, diligence is the rule and not the exception. If laborers share in the success of the enterprise, then the interest so derived will inspire alertness and new ideas. Labor efficiency is not dictated, it is stimulated. Motivated workers themselves reduce the labor utilization problem considerably.

It is the function of management, however, to provide an amount of work equivalent to the supply of laborers or to regulate the number of laborers in proportion to the quantity of work. The former is more desirable though more challenging to the manager of the commercial cattle feed yard. Operating at a relatively constant level of capacity is one of the most important ways of achieving this function. When cattle numbers fluctuate radically at a given feed yard, it can be concluded with assurance that existing labor will either be over-employed or under-employed, both cases of which detract from true labor utilization and efficiency. Under such conditions there will always occur intermittent transitional periods prior to any necessary labor numbers adjustment.

Machinery and equipment available also determines to a high degree the number of laborers needed to run a given level of operation. As commercial feed yards become larger and more mechanized the number of cattle fed in a year per laborer will be greatly increased from the 1957 ratio of 986:1 for the state commercial cattle industry as a whole. The number of cattle fed in a year per laborer, excluding the feed lot operator, for individual yards varied from 333 head to 2,500 head in 1957. An apparent relationship between the degree of mechanization and the cattle per laborer ratio existed. Five lots fed 1,000 or more cattle in a year per laborer; four of the five were considered to be of the most elaborate in the state.

Commercial feed yards are becoming more and more self-contained units, performing many of their own services that previously were rendered by outside parties. Labor demands are in part affected by this apparent change. As well as providing feed processing services and transportation requirements, the modern day commercial yard also attends to a major share of its own veterinary needs. The self-contained labor unit must be trained and able to perform such services.

Disease Control Measures

It is a general practice for commercial feed lots to perform a substantial portion of most routine veterinary needs. It is also a general observation that most feed yards provide at least a partial parasite control program. Although their success has been commendable as displayed by their combined average death loss of less than 0.8 percent, it is probable that hidden economic losses attributed to reduced gains and decreased feed efficiency were sustained on many lots due to an inadequate parasite control program. These losses go unnoticed by most feed lot operators, and except in extreme cases, cannot be accurately measured under ordinary conditions.

Only one of the 16 feed yards provided what was considered to be an adequate parasite control program. Most of the others were aware of the problem and guarded against it but restricted their precautionary measures only to Southern cattle and in other extreme or obvious particular cases. The most adequate routine program observed was applied to all cattle entering the particular feed yard where it existed. A therapeutic dose of 60 grams of phenothiazine per head was mixed in the feed and fed to all of the cattle entering the yard after four or five days. In addition, external parasites were curbed by use of systemics, spraying, and by providing back rubbers in the lots.

Other routine disease control measures taken by certain of the feed lots were: Feeding aureomycin in nine yards to prevent pneumonia and scours, vaccinating all cattle entering several lots in a localized area to avoid rhino-tracheitis (red-nose) which incurred abnormally heavy death losses one year on one lot in particular, and the frequent self-administration of pennicilin, streptomycin, and sulfa to various commonplace ailments as foot rot, pink-eye, etc. In all cases the services of a local veterinarian were obtained on the occasion of more serious disease and injury problems.

No commercial feed yard felt itself large enough in 1958 to employ the full time services of a trained veterinarian, however, this possibility is likely to arise as feeding operations become larger.

COST STRUCTURE OF THE ENTERPRISE

Factors Associated with Investments in a Commercial Cattle Feed Lot

This study was not designed to include a detailed cost analysis of commercial cattle feed lots. Specific information regarding initial investments in land and facilities was not obtained, however, data collected in relation to the basic cost structure of the industry reveals some insight.

In most cases operations apparently were started with a minimum of facilities. Most of the lots expanded and added equipment from time to time. Obviously the degree of elaboration desired influences the amount of capital investment required.

Thirteen of the 16 feed lots began operations within the last 10 years. Of the 13 lots, those having been in business five or more years generally exhibited the most adequate facilities. One exception to this generalization was a particular feed lot in operation for two years which had perhaps the most elaborate facilities in the state.

In considering the cost of starting a commercial cattle feed lot it is apparent, therefore, that initial costs are subject to extensive variability within a certain range but above a mandatory minimum.

Contributing cost factors may be categorized under two main headings: (1) Land and (2) capital equipment, both of which may be independently analyzed. Since actual cost figures are obviously variable through subsequent time periods as well as in application to different feed lot setups no attempt will be made to derive a minimum investment figure. Rather, the two main cost factors, land and capital equipment, will be investigated so as to enable an appropriate estimate of initial costs at any time period and under any given set of circumstances.

The investment in land is, of course, directly proportional to the amount needed and to cost per acre which to a considerable degree is reflected in the location of the land. The amount of land needed is in turn dependent primarily upon whether or not any feed grains or roughages will be raised and to a lesser extent the intended size of operation. Of the 16 feed lots, seven raised a portion of either their total annual grain or roughage supply or both. A portion of the silage ranging from 25 to 100 percent of the particular feed lots total amount fed was raised by each of these seven feeders. Together, the seven raised 54.8 percent of their needed silage. Six of the seven feed lots raised a percentage of their total annual supply of hay fed ranging from five to 100 percent with an average of 18.8 percent for the seven crop integrated lots. Five of the seven lots raised some portion of their total grain supply fed, the percentage ranging from five to 25 percent, with an average of 4.6 percent for the seven yards.

For the seven feed lots that raised some of their total annual feed supply the average number of cropped acres per operation was 1,111 with a range of 400 to 2,000 acres. These acreage figures included both owned and leased land.

If a farming enterprise demanding crop land is to be an integrated phase of the feeding operation it is apparent then that the land investment will vary accordingly. In appraising the economics of an integrated farming and feeding enterprise it must be borne in mind that manure, a valuable by-product of the cattle feeding industry, is fully utilized as an asset to the particular operation at which it is produced only if it has a ready outlet. If it has no outlet it is a liability as was the case on five of the 16 feed lots.

On four other feed lots it was merely given away for the hauling or at a charge that no more than covered the cost of cleaning the pens and loading. The remaining seven lots were able to apply the manure produced annually to their own or leased crop land. Only in this manner was the full utility of this valuable by-product realized, for as yet, no other ready outlets for manure have expressed themselves in Kansas. Whether it be the reluctance of farmers or the localized abundance of manure in the immediate feed lot vicinity it nevertheless remains a fact that manure often times cannot be given away.

It was previously stated that the intended size of operation influences, but to a lesser degree, the total amount of land needed to set up a commercial cattle feed lot. Disregarding here the inclusion of crop land, and considering only that land which will be taken up by the pens, buildings, and alleys, it is similarly evident that land investment is subject to variation.

The acreage devoted to pens and buildings on the 16 feed lots averaged 59.5 acres per lot with a range of five to 240 acres per lot. Thirteen of the 16 feed lots utilized 100 acres or less for pens and buildings. In comparing the total feed yard capacity with the number of acres in pens and buildings it was observed that from 70 to 110 head of cattle per acre may be used as an estimator of the number of acres required to establish a given scale of operation. More or less efficient use of the land than this may be made according to the degree of planning.

The second factor that determines the amount invested in land is the location of that land. Location, of course, affects the per acre value of land and is, therefore, worthy of due consideration in estimating the initial cost of starting a commercial cattle feed lot. Location itself encompasses many other considerations besides the effect it has on the initial investment. These side regards, important as they may be, will be treated lightly here placing key emphasis on the effect location of land has on the initial investment.

Features of land sites important to commercial cattle feed lots that will have a lasting effect on the operation are such things as: (1) Topography, (2) soil structure, (3) accessibility to roads and railroads, (4) relation to feeder cattle supply and markets, (5) proximity to livestock market outlets including terminals, auctions and meat packing plants, (6) potential for expansion, (7) labor supply, (8) local feed situation, and (9) local tax rates. In addition to these considerations there are various sociological factors distinct to each area that merit regard.

The combined influence of the above location features act together in determining the per acre value of a plot of ground being considered for a commercial cattle feed lot. A suitable tract of land fulfilling the above features will be further influenced as to its value by the alternative uses to which that land may be put, thereby reflecting its local demand.

A concluding statement concerning the first of the two main initial cost contributing factors is that the investment in land, although quite subject to variability, is an important investment for it has far reaching effects on the future of the feed lot enterprise.

The second main category affecting the cost of starting a commercial cattle feed lot is the investment in capital equipment. Here again, the amount of investment is in direct relation to the degree of elaboration and the intended scale of operation desired.

Where a farming enterprise is to be integrated with the feeding operation an added investment in farm implements will exist. No attempt will be made to appraise the cost of necessary farm machinery since the equipment required for crop production varies according to the type of farming enterprise encountered. Farm machinery costs change over time but are readily available such that an up-to-date picture is easily obtained at the time it is needed.

Ignoring farm implement costs and considering only investment in capital equipment directly related to the feeding operation there are basically two alternative setups to be appraised, a feed yard either with feed processing equipment or without feed processing equipment.

As previously stated 13 of the 16 feed lots did 100 percent of their own feed milling and mixing. One additional lot performed 50 percent of its own feed milling. The remaining two feed lots utilized the services of a local cooperative feed mill, thereby eliminating the need for capital investment in feed processing equipment.

The economics of integrating feed processing with the feed lot operation has previously been discussed. The fact was revealed that a significant portion of the total revenue is derived from the mark-up on feed. Capital investment in feed processing equipment is undoubtedly a major item if not the paramount one, excluding land, in determining the initial cost of starting a feed lot. Excluding feed lot owners who also owned or were in partnership with local feed mills, of which there were four such situations in the state, it may be safely estimated that investment in feed processing, handling and storage facilities on the remaining lots ranged in value from $4,000 to $150,000. It would be of doubtful value to prescribe what minimum cost might be anticipated here in view of the extreme variation from one basic operation to another. A general observation is that the most thriving feed lots appeared to have the most complete feed processing, handling, and storage facilities. Obviously capital investment in this line of equipment must be directly associated with the intended feed lot capacity and also be adaptable to expansion should the future feed lot capacity be expanded.

The concluding remarks pertaining to the investment in capital equipment can be regarded as a description of the minimum cost of starting a commercial cattle feed lot assuming the following: (1) A farming enterprise will not be integrated with the feeding operation; therefore, no feed grains or roughage will be produced, (2) the land investment has already been made providing for only that land necessary for pens and buildings, and (3) all feed will be purchased, rendering unnecessary an investment in feed processing equipment.

Starting a feed lot under these conditions there remains only the investment in capital equipment essential to the establishment of a setup of this type. This investment, of course, pertains also to the other alternative types of operations.

Included in this array of essential capital equipment are such things as: Buildings, sheds, and storage structures; the feed lots themselves demanding fencing, windbreaks, feed bunks, hay racks, and concrete platforms in some areas; vehicles including trucks, tractors, and wagons; power and water facilities; as well as miscellaneous items of which an adequate cattle scale should not be neglected.

It is not the purpose of this study to relate the specific needs of a particular feed lot since each is a unique system in itself and possesses distinct characteristics. The specific needs of the feed lot will be expressed as the operation is expanded. As an example of this statement, certain buildings may at first have little use but as the operation grows a need for office space, a repair shop, a laboratory and possibly a treatment room may emerge. The capital invested in a feed lot is a dynamic phase of the business. It is subject to considerable variation.

Land and capital equipment, the two main categories under which lie the specific contributing factors to be regarded in estimating the cost of starting a commercial cattle feed lot, both merit equal respect, for the influence each has on the future operational practices is a lasting one.

This discussion of the cost starting a commercial cattle feed lot will be concluded with two basic principles that cannot be lost sight of in the process of decision making. (1) The capital investment must parallel the intended feed lot capacity. (2) The investment in capital equipment must be weighed against the future labor cost that it will replace.

Establishing a goal before establishing a feed lot will enable a potential operator to apply the facts and principles herein discussed to any particular situation. A clear understanding of the problem precipitates a successful application of the solution.

Appraisal of Operating Costs and Income

A commercial cattle feeding enterprise is characterized by a certain basic cost structure that may be used in ascertaining profit under particular cost and price conditions. A typical framework will be developed and then applied to 1958 costs and prices making use of various average figures already established and presented in this thesis. An estimated profit yield and approximate rate of return on investment will thus be determined for this hypothetical, but relevant, situation.

The 16 feeders interviewed were asked to estimate their total annual expenditures for each of the various cost items associated with the commercial cattle feeding business. Since they were approximations rather than precise figures they were not considered to be accurate enough to make actual cost comparisons between lots of various sizes and levels of operation. Lots reporting complete cost estimates that appeared to be reasonable were used in deriving average costs per head fed in a year. From these lots, costs were grouped into three categories; feed, other variable, and fixed. To further check the accuracy of these respective costs per head fed, prices prevailing in 1958 were applied to a hypothetical feed yard. Comparing the reported computed cost per head with the hypothetically applied computed cost per head, it was found that the two cases were not seriously different from each other. The model herein developed utilizes the hypothetically applied feed prices for the feed cost component, and the reported computed other variable and fixed cost components.

This appraisal considers the short-run, regarding certain of the cost items as being fixed although labor is classed as one of the other variable costs. A long-run analysis would regard all in-put factors as variable.

It is recognized that the two major factors affecting cost per head are size of lot and degree of capacity utilization. A precise cost study would examine the effect each has on per unit costs. This particular study was not so designed.

Total costs may be categorized under three fundamental headings: Feed costs, other variable costs, and fixed costs. The first of these is by far the major cost component, comprising from 80 to 95 percent of the total costs with an average of about 90 percent for the 16 feed lots. Following feed costs are other variable costs (a detailed description follows) which, for the 16 lots, averaged about eight percent of the total costs with a range among the lots from four to 15 percent. The least important contributor to total costs are fixed costs which comprised an average of about two percent with individual lots reporting from one to four percent of the total costs attributed to fixed costs. Applicable percentages of the three components for particular feed lots depend upon such things as; size of lot, capacity utilization, relative costs of the items within each component, and the extent of home feed production. Each of the three fundamental cost components, feed, other variable, and fixed expenses, can be examined and further broken down into the individual items that comprise each component.

Feed costs are made up of grain, roughage, protein, salt, mineral, and other supplementary feed additives. The first three items account for practically all of the feed costs and since the remaining items are often added to the protein costs, only grain, roughage, and protein will be examined in detail.

1. The grain portion of the ration is the most important feed cost. Under 1958 feed prices, grain accounted for about 77 percent of the total cost of a typical ration. In Kansas, the usual feed grains used are corn and milo depending on the relative prices of the two grains.

2. The roughage portion of a typical ration fed in 1958 accounted for almost 10 percent of the total feed costs. The chief roughages utilized in the 16 commercial feed lots were silage and hay. Either sorghum or corn silage and a combination of prairie and alfalfa hay were used.

Reported also were such bulky feeds as cottonseed hulls, bran, dehydrated corn cobs, and ground wheat straw.

3. The protein portion of a typical ration fed in 1958 attributed about 13 percent to the total feed costs. Whereas some feed lots used strictly commercial protein supplements, most of the yards made bulk purchases of various protein feeds including chiefly cottonseed meal and soybean meal.

The second fundamental cost component contributing to total operating costs is other variable costs aside from feed costs. This component is comprised of numerous items, each of which is subject to variation as the level of operation on a given lot is varied. Some of the major items in this category are: Maintenance and repair, straw and other bedding, death loss on self-owned cattle and those fed for certain packers, veterinary and medical expenses, labor, fuel and power, and transportation costs. These items combined made up approximately eight percent of the total operating costs, on the average, for the 16 feed lots in 1958.

The last basic cost component is made up of those fixed cost items that do not tend to vary with fluctuations in the level of operation on a particular feed lot. Depreciation, taxes, interest on investment, and insurance are the primary items that contribute to the fixed cost component. Together they comprised only a small portion of the total operating costs in 1958, as displayed by the computed average of about two percent for all of the lots reporting. This seemingly trivial percentage is subject to considerable variation among particular lots depending principally upon the degree of capacity utilization. The total income of a commercial yard may be derived from any or all of seven different sources.

1. Custom fed feed cost remittal.

2. A portion of the other variable costs component aside from feed costs.
3. Yardage charges.
4. Feed price mark-up (processing and handling charge).
5. Charge on cattle fed on a per pound of gain basis.
6. Sale of self-owned cattle.
7. Other credits such as manure, hogs, etc.

The first five sources pertain directly to the commercial feeding of cattle whereas the last two are either the speculative venture of the feed lot operator or the indirect benefit of the custom feeding phase of the enterprise.

The feed consumed by cattle fed on a custom basis is an expense of the owner of the cattle. Although the feed is pre-financed, often in monthly time periods, by the feed lot operator the full cost of the feed is remitted by the cattle owner. Just as feed cost was the most important component on the expense side of the accounting ledger, feed cost remittal is the primary item on the income side of the ledger.

Excluding feed cost, there is as well a portion of the other variable cost component that is directly remitted. In most cases the owner of custom fed cattle was billed directly for veterinary and medical expenses incurred and for straw or other bedding where used. The feed lot owner, therefore is fully reimbursed for these two cost items and is justified in entering them as income. This source of income is the least significant of the seven as revealed by the 1958 average value of about 50 cents per head.

Yardage charges vary from lot to lot, however, the most frequently used charge was five cents per head per day. Some other lots charged up to 10 cents per head per day as was discussed in the section dealing with types of contractual arrangements. Yardage charge as a source of income is estimated to account for slightly less than half of the actual income apart from the mere remittals previously related. This applies only to the custom fed cattle that are contracted under this type feeding arrangement.

Under the same circumstances, it is believed that the feed price mark-up for handling and processing accounts for the remaining actual income (slightly over half) aside from the mere remittals. Specific feed handling and processing price mark-ups reported to exist in 1958 were: Grain, 20 cents per hundredweight: hay, $2.50 per ton; protein, $2.00 per ton. These mark-ups may not be typical, however, they were found to exist in 1958. It is assumed that they were representative rates, but would be expected to differ significantly among various feed lots depending in part on their respective yardage charge rates.

The only direct source of income associated with custom fed cattle that are fed on a charge per pound of gain basis is that charge itself. There are no direct feed and other variable costs remittals, no yardage charge rates as such, and no feed handling and processing price mark-ups per se. Rather, they are all included in the contracted price to be paid for each pound of gain applied. Packer owned cattle were for the most part fed in this manner, therefore, less than 10 percent of all custom fed cattle in Kansas were probably so fed in 1958. That year, in the fall, the charge was about 22 cents per pound of gain for light heifers, and 23 to 24 cents per pound of gain for steers. Again, these rates apply only to a given age, weight, and grade of cattle. This type of basic contract will be compared with the yardage charge plus feed price mark-up type contract from a cost-income-profit angle at the end of this section.

The two remaining sources of income associated with a commercial cattle feed lot are not directly attributed to the custom feeding aspect of the enterprise. They may be quite influential contributors to the total income, however, uncertainty characterizes the first while unwillingness dominates the second. Profit from self-owned cattle or hogs and credit for manure may or may not be significant income contributors.

Speculation and economic desirability of feed lot capacity utilization motivate the inclusion of some self-owned cattle feeding in each of the 16 yards. For the state in 1957 it amounted to 38.2 percent of the total number fed in commercial feed lots. The cattle price margin determines the income effect of this phase of the enterprise. Since the margin is subject to unpredictable fluctuations the profit derived therefrom may be large or it may be small. As well, it may be negative. Under conditions that existed in 1958 self-owned cattle feeding would have been the major contributor to income and also to profit for the lot possessing the average number of self-owned cattle.

Hog feeding, though not typically associated with Kansas commercial cattle feed lots, could similarly exert a significant effect on the total income. As a complementary phase of the cattle enterprise, hogs would be able to derive an indirect benefit of not only waste feed utilization but labor and equipment (feed processing facilities) utilization.

The value of manure has previously been discussed. As a contributor to total income, manure has in general, received but little attention in many Kansas commercial feed lots. It is concluded that manure production could and should be an asset to the enterprise. As such, it is believed to possess a potential value of $1.00 per head.

Combining the costs incurred with the income derived in the commercial cattle feeding industry a basic framework is developed from which the estimated profit margin may be derived. Relative prices of the various cost items and income contributors determine more precisely what that margin will be at any particular time.

It is the economic goal of the feed lot operator to maximize net profit. At his disposal are several methods of accomplishing this goal. From the standpoint of income he is able to; regulate the yardage charge rate, adjust the feed handling and processing price mark-up, determine the rate at which cattle fed on a charge per pound of gain basis will be accepted, solicit customers as the need for cattle expresses itself, control the number of self-owned cattle to be fed, and also to develop outlets for the manure produced in the yard. Only by closely examining each of these actual income contributors can the feed lot operator maximize income.

From the standpoint of costs, the efficient manager has some control over certain of the variable costs and an indirect influence on fixed costs. Although the general feed price level cannot be manipulated at will, significant savings can be made by bulk purchases, forward contracting, and aggressive bargaining. Adequate feed storage facilities and professional feed buying techniques result in reduced costs and as well expanded income opportunities through resale at current going prices. Death loss and the hidden economic losses associated with inadequate disease and parasite control measures may be decreased considerably by the feed yard operators' decisions. The variable cost component is also affected by labor efficiency within a particular feed lot. Labor efficiency is in turn partly determined by feed yard capacity utilization. Capacity utilization exerts its primary influence on the third cost component, namely average fixed cost items. Depreciation, taxes, interest on investment, and insurance per head together are more affected by the extent of feed yard capacity utilization than by any other single factor. Since these cost items do not tend to change as the level of a given operation is varied their cost as a part of the total costs is smallest when the enterprise is operating near full capacity. A feed yard operator, therefore, has an indirect influence on fixed costs per head as he strives to maintain a constant operating level and attempts to keep the yard as near full as possible.

It is apparent that profits may be great or they may be small for any particular commercial cattle feed lot. The costs incurred and the income derived in a commercial cattle feeding operation are more easily understood if they are applied to a given situation. The remainder of this section is devoted to accomplishing that purpose.

Cost-Income-Profit Model

Utilizing averages for various items derived from information obtained from the 16 feed yards a somewhat typical hypothetical commercial cattle feed lot will be established. This representative feed yard will serve to illustrate the various costs incurred, income derived, and profits resulting that are associated with a commercial feeding operation. Cost and price conditions under which the yard will function are those that existed in the fall of 1958. Two other alternative methods of feeding, from the standpoint of cattle ownership, will then be presented after which a typical situation, combining in their applicable proportions the three types of feeding will establish an estimated profit margin and return on investment for the representative lot in 1958. Having analyzed the three essential feeding systems (two basic contract types and the self-ownership method) a point of significance regarding the two basic types of contracts will be presented.

The following factors characterize the hypothetical yard and cost-price conditions that existed at that time:

1. Feed lot capacity, (maximum number of head that can be fed at any one time), 5,000. (Average for the 16 lots was 5,206).
2. Feed 9,000 head per year. (Average for the 16 was 9,240).
3. Rate of turnover, 1.8 times. (Same as the 16 lot average).
4. Cattle remain on feed for 100 days. (Average, 90-120 days).
5. Good grade feeder cattle weigh in at 800 pounds.
6. Choice grade slaughter cattle weigh out at 1,050 pounds.
7. Gain 250 pounds in 100 days, therefore, the average daily gain, 2.5 pounds.
8. Custom fed cattle fed on a charge per pound of gain basis were so fed at the following rates; heifers, 22 cents per pound of gain; steers, 23-24 cents per pound of gain.
9. Yardage charge rate for other custom fed cattle, five cents per head per day.
10. Feed price mark-up rates for handling and processing; grain, 20 cents per hundredweight; hay, $2.50 per ton; protein, $2.00 per ton.
11. Feed prices prevailing: Corn, $1.12 per bushel; milo, $2.00

per hundredweight; hay, $16.00 per ton; silage, $6.00 per ton; and protein supplement with certain additives included, $70.00 per ton.

12. Cattle prices prevailing: 800 pound good grade feeders, $24.00 per hundredweight; 1,050 pound choice grade slaughter cattle, $26.00 per hundredweight.

Under the above listed circumstances a more detailed examination of the cost structure of a commercial cattle feeding enterprise is facilitated. First costs, then income will be evaulated (Table 14).

Total expense is comprised of the three fundamental cost components previously described; feed, other variable, and fixed costs. In this particular case feed costs amount to 88.8 percent, other variable costs 8.5 percent, and fixed costs 2.7 percent of the total expenses. The total cost per head was $58.60, composed of $52.00 for feed, $5.00 for other variable costs, and $1.60 for fixed expenses.

Feed cost was obtained by assuming a daily ration of 20 pounds of grain at two cents per pound (40 cents per day), 10 pounds of roughage at one-half cent per pound (five cents per day), and two pounds of protein at 3.5 cents per pound (seven cents per day). Therefore, 52 cents per day times 100 days results in $52.00 per head feed costs. This computation was reasonably close to similar estimates obtained from the 16 feed lots interviewed. Because it was in line with their estimates it was concluded that the figures obtained relating to other variable and fixed costs could be considered as reliable estimates of these two remaining cost components. Variable costs aside from feed, therefore, consisted of maintenance and repair, straw and other bedding, death losses, veterinary and medical expenses, labor, fuel, power, and transportation, accounted for slightly more than $5.00 per head as a 16 lot average. This model assesses a cost of $5.00 per head for these other variable costs. Fixed costs, consisted of depreciation, taxes, interest on investment and insurance. Fixed costs amounted to slightly less than $1.60 per head as a 16 lot average. Again, for simplicity this model assesses a value of $1.60 per head for fixed costs. Over-all expenses on a per head per 100 day feeding period basis is thus $58.60.

Total income is derived from the various sources previously described, namely, feed and some other variable cost remittals, yardage, and feed price mark-up. These items, excluding miscellaneous credits (manure, hogs, etc.) are used in the initial model to derive total income. Further expansion, however, considering the two alternative types of feeding methods will also take into account sale of self-owned cattle, and the charge on cattle fed on a per pound of gain basis. For the moment, and for the initial model, total income per head was determined to be $62.95. Of this total income figure, $52.00 was attributed to feed cost remittal, 50 cents to a portion of the other variable costs (veterinary, medical, and bedding) remittal, $5.00 to yardage charge (five cents per day times 100 days) and $5.45 to feed handling and processing price mark-up. The last income source was the major contributor to actual income over mere remittals, making up somewhat more than half the profit. This $5.45 income per head was composed of representative mark-up rates applied to the respective quantities of feeds consumed during the 100 day feeding period: Grain, 20 cents per hundredweight times 2,000 pounds ($4.00 per head); roughage, $2.50 per ton times 1,000 pounds ($1.25 per head); protein, 10 cents per hundredweight times 200 pounds (20 cents per head). Total income derived from the four sources for a 100 day feeding period was thus $62.95 per head.

The difference between total costs and total income was $4.35 per head which may be regarded as profit before taxes are paid. The total profit per year for the feed lot, assuming all cattle custom fed on a yardage plus feed price mark-up basis, was, therefore, $39,150 (9,000 head times $4.35 per head profit). If the capital value of the feed yard is set at $200,000 then the annual profit derived therefrom would yield 19.6 percent return on investment. Though not determined precisely the estimated $200,000 value of the hypothetical 5,000 head capacity feed yard is believed to be reasonable. It is possible that such a lot could be worth more or it could be worth less than that amount. One of the 16 lots,over twice the size of this model, quoted its value as being $300,000 as did another that was somewhat larger than the model. A third yard, about the same size as the model, appraised its worth at $150,000 depreciating $15,000 per year, a rate of 10 percent. Still another of the 16 lots, over three times larger than the model, depreciated itself only $11,000 per year. Since this latter lot reported no depreciation rate, it is assumed that either a very small rate was applied or the lot was valued at considerably less than $200,000. The former was more likely to be the case. General observations such as these and others lead the author to believe that the estimated investment of the hypothetical yard is in line with current values.

The initial model, thus far presented, has considered only one of the three types of feeding arrangements that were commonly found to exist in commercial feed yards. It concerned the most prevalent type; namely, custom feeding on a yardage charge plus feed handling and processing price mark-up basis. The two other types are; custom feeding on a charge per pound of gain basis, and feeding self-owned cattle.

Of the three methods, custom feeding on a charge per pound of gain basis in recent years has played the smallest role. Generally, only packer-owned cattle were contracted on this basis. In 1957, approximately 11 percent of all cattle fed in commercial yards were owned by packers. Of this 11 percent, it is estimated that the bulk were owned by certain packers who contracted cattle to be fed only on a charge per pound of gain basis such that about 10 percent of all cattle fed in commercial yards in 1957 were so contracted. Under this system and in accordance with the assumptions already established, total costs per head for a 100 day feeding period and 250 pounds of gain would remain at $58.60, the composition of which is the same as under the initial model analysis. The previous income sources evaluated in that model are here eliminated. Instead, there exists only one primary income source which, in effect, combines income components, covers cost components, and includes the margin of profit. The charge per pound of gain applied to cattle so contracted is adjusted so as to accomplish this goal. In the fall of 1958 cattle so contracted were fed at a charge of 22 cents for heifers and 23-24 cents per pound of gain for steers. The uppermost figure, 24 cents, will be utilized here in illustrating the profit margin since the cattle being fed in this model are of heavier weights and would be expected to make more costly gains. Total income is, therefore, the result of 250 pounds of gain times 24 cents per pound, or $60 per head. The difference between total income ($60) and total cost($58.60) is the profit per head before taxes ($1.40 per head). If all of the cattle had been fed on this basis the total annual income before taxes would have been $12,600 (9,000 head times $1.40 per head profit). Rate of return on the $200,000 investment would thus have been 6.3 percent, about one-third as much as in the initial model.

To illustrate a point that will be expanded upon later, one assumption in the above set of circumstances will be varied; namely, the average daily gain. First, the assumed 2.5 pounds per day average gain will be increased to 2.6 pounds per day, thus, 260 pounds of gain in 100 days rather than 250 pounds. This slight increase of one-tenth pound per head per day or 10 pounds per head per feeding period yields the following result. Total income per head is now $62.40, therefore, profit before taxes per head is now $3.80 ($62.40 minus $58.60). Total annual profit before taxes is now $34,200 (9,000 head times $3.80 per head), yielding a 17.1 percent rate of return on a $200,000 investment, only slightly under that which was derived in the initial model (19.6 percent).

A further increase in the average daily gain of a mere 0.05 pound to the preceding rate of 2.6 pounds results in an even greater profit than that derived in the initial model. At a present 2.65 pounds per day average gain for 100 days, a total gain of 265 pounds per head would be added. This is just 15 pounds more per head than was initially assumed. Total income per head would now be $63.60 (265 pounds times 24 cents per pound), therefore, profit per head before taxes would be $5.00 ($63.60 minus $58.60). Total annual profit before taxes would be $45,000 (9,000 head times $5.00 per head profit), yielding a 22.5 percent rate of return on a $200,000 investment, significantly more than that which was derived in the initial model (19.6 percent).

Total costs were maintained constant in the previous two examples inferring that feed costs were not increased as the total gains were upgraded slightly. This assumption is justified in the light of two factors. The prescribed ration is considered sufficient to accomplish gains at either 2.5 or 2.65 pounds per day for the weight of cattle being fed, depending to a considerable extent on the feeding ability of the yard operator and as well on the inherent ability of the cattle. Furthermore, the slight 15 pounds difference between the two rates of gain for a 100 day feeding period is not so large as to result in any drastic increase in the total amount of feed consumed given a less flexible feed conversion ratio for a particular lot of cattle.

The most revealing point extracted from the foregoing analysis of two types of cattle feeding that could exist in a commercial feed yard is not necessarily the apparent high rates of return on investment derived under 1958 cost-price conditions but rather the relative differences between these two methods of custom feeding. More specifically the important differences between these two basic types of contracts is now more easily seen. The popular arrangement involving a yardage charge plus feed price mark-up is observed to be less dependent upon the ability of the yard operator as an efficient cattle feeder than is the less commonly used charge per pound of gain type contract. In the latter case the profit margin, and in turn the rate of return on investment, is determined almost entirely by how well the feed lot operator accomplishes the goal of economizing the rate of gain and feeding efficiency. Associated with this type arrangement would be a greater incentive to minimize waste feed, instill in the labor crew proper feeding and handling practices, reduce death loss and hidden economic losses due to inadequate routine disease and parasite control programs, formulate the most profitable ration possible both from the standpoint of nutritive value and by utilizing the most economical alternative ingredients as based on relative prices in different time periods, and various other practices that would enhance rate of gain and feeding efficiency. This does not infer that cattle fed on a yardage charge plus feed price mark-up basis do not receive adequate attention from the feed yard operator. On the contrary, in most of the 16 lots observed the cattle were all given equal attention. It cannot be overlooked, however, that the incentive to produce is considerably greater in the one case than in the other. It is probable that if a substantial proportion of the profits were derived from cattle fed on a charge per pound of gain basis an even greater effort would be made to maximize rate of gain and feeding efficiency. This being the case, it must be concluded that if rates are accurately determined and adjusted as often as the cost-price conditions change significantly, then the charge per pound of gain type contract is more desirable and equitable than the yardage charge plus feed handling and processing price mark-up type contract. The infrequent use of the former in 1958, except when so commanded by certain packers along with the over-whelming popularity of the latter contractual agreement, further indicates that the charge per pound of gain type contract was currently de-emphasized by most feed lot operators.

A further extension of the initial model and assumptions previously established will serve to illustrate the exceptionally favorable cost-price conditions that existed in 1958 for the cattle feeding industry in general. A substantial portion of the cattle fed in commercial cattle feed lots in Kansas were the investment of the feed lot operator himself. Self-owned cattle accounted for 38.2 percent of the total number fed in commercial yards in 1957. For simplicity sake the model now to be constructed will assume that in 1958 the proportion of self-owned cattle amounted to 40 percent of the total number fed in commercial yards. Before constructing this final model, which will be a typical situation in that the approximate proportions of the various types of feeding methods will be applied, a lot in which all 9,000 of the cattle fed were self-owned will be examined. It is recognized that such an arrangement would not have been considered a commercial feed lot under the definition used in this study but it is presented here for illustrative purposes. The initial per head investment in feeder cattle was $192 (800 pounds times 24 cents per pound). Total investment in the 1,050 pound slaughter cattle 100 days later was $250.60 per head ($192 initial cost plus $58.60 feed, other variable, and fixed costs). Total income derived from the sale of choice grade slaughter cattle was $273 per head (1,050 pounds times 26 cents per pound). Profit per head before taxes was, therefore, $22.40 ($273 total income minus $250.60 total expenses). Total annual profit before taxes was $201,600 (9,000 head times $22.40 profit per head), yielding 10.5 percent rate of return on a $1,928,000 investment. Investment here includes the purchase of 9,000 head of feeders. It is noteworthy to mention that a profit of $1.40 per head under similar conditions would have resulted if no margin had existed. That is, if feeder cattle cost 24 cents per pound and they sold for 24 cents per pound as fed cattle 100 days later they would still have derived a profit of $1.40 per head.

The final model may be regarded as a typical commercial cattle feed lot operating under the same assumptions as the foregoing examples, therefore, under approximate conditions that existed in 1958. In this model appropriate proportions of the previously discussed methods of feeding will be considered. The breakdown on the three types of feeding for the same hypothetical feed yard is as follows: Custom cattle fed on a yardage charge plus feed handling and processing price mark-up, 50 percent; custom cattle fed on a charge per pound of gain basis, 10 percent; self-owned cattle, 40 percent. Applying these percentages to the respective total annual profits before taxes results in a total annual profit before taxes for the typical commercial cattle feed yard of $101,475 which would yield 11.4 percent rate of return on a $891,200 investment. Investment here includes the purchase of 3,600 head of self-owned feeders.

The initial model is shown in Table 14, whereas the four alternative results with respective annual profits before taxes and the extimated rates of return on investment are exhibited in Table 15.

ANALYSIS OF SLAUGHTER CATTLE DISPOSITION METHODS

General Comments

One of the most important functions associated with any livestock producing enterprise is the marketing phase of the business. In the cattle feeding industry the alert and efficient feeders who have successfully accomplished the technical objective of economy in rate of gain and feeding efficiency on their cattle are confronted with still another goal. Their final objective is to obtain the highest possible price for their finished cattle. To treat this final phase of the production process lightly is in effect off-setting the previous effort of successfully feeding the cattle.

In commercial feed yards the task of marketing was usually left up to the owner of the cattle. In some cases, and where customers so desired, the feed lot operator would assume the responsibility of marketing or at least advise and assist the cattle owners in accomplishing the marketing function. Feed yard operators' self-owned cattle were generally marketed by the operators own efforts.

Table 14. Cost structure of the enterprise: Hypothetical commercial cattle feed lot operating under 1958 approximate conditions.[1]

Per head per 100 days			
EXPENSES		INCOME	
Feed Costs	$ 52.00	Feed Cost Remittal	$ 52.00
Grain @ 2¢/lb., 20 lbs./day	(40.00)		
Roughage @ 0.5¢/lb., 10 lbs./day	(5.00)	Other Variable Cost Remittal (only for veterinary and bedding)	.50
Protein @ 3.5¢/lb., 2 lbs./day	(7.00)		
Other Variable Costs (maintenance and repair, straw, death losses, veterinary, labor, fuel and power, transportation, etc.)	5.00	Yardage @ 5¢/head/day	5.00
		Feed Price Mark-Up	5.45
		Grain @ 20¢/cwt., 2,000 lbs.	(4.00)
		Roughage @ $2.50/ton, 1,000 lbs.	(1.25)
Fixed Costs (depreciation, taxes, interest, insurance)	1.60	Protein @ 10¢/cwt., 200 lbs.	(.20)
		TOTAL INCOME (excluding manure, hogs, etc.)	$ 62.95
TOTAL COSTS	$ 58.60		

Total Profit per Head, $4.35

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[1] Assumptions previously established in this section apply to this model.

Table 15. Calculating profit and rate of return on investment for four alternative commercial cattle feeding models.[1]

Type of feeding by ownership status or contract	Method of Calculation	Total annual profit before taxes (dollars)	Rate of return on $200,000 investment (%)
1. ALL cattle fed on yardage charge plus feed price mark-up.	9,000 head X $4.35 =	$ 39,150	19.6
2. ALL cattle fed on charge per pound gain basis.	a) 250 lb. gain X 24¢/lb. = $60/head $60 - $58.60 = $1.40/head 9,000 head X $1.40 =	12,600	6.3
	b) 260 lb. gain X 24¢/lb. = $62.40 $62.40 - $58.60 = $3.80 9,000 head X $3.80 =	34,200	17.1
3. ALL cattle self-owned.	800 lb. feeders X 24¢/lb. = $192 $192 + $58.60 = $250.60 1,050 lb. slaughters X 26¢/lb. = $273 $273 - $250.60 = $22.40 9,000 head X $22.40 =	201,600	(Total investment now is $1,928,000; including purchase of the feeders.) 10.5
4. TYPICAL commercial lot 50% fed as "type 1" 10% fed as "type 2" 40% fed as "type 3"	$ 39,150 X 50% = $ 19,575 12,600 X 10% = $ 1,260 201,600 X 40% = $ 80,640 (9,000 hd.) 100% = $101,475	101,475	(Total investment here is $891,200; including purchase of 3,600 self-owned feeders.) 11.4

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[1] Assumptions previously established in this section apply to these results.

Various alternative types of marketing channels frequently exist in a given area enabling a comparison and selection of the most profitable one at any given time. It is necessary for the cattle owner to objectively compare the alternative market agencies at his disposal so that on each occasion the most profitable outlet is being utilized.

Before discussing the various types of marketing channels a comparison of the two basic conditions of livestock sales will be made. The traditional live-grade, weight, and estimated yield was observed to be far more popular in commercial yards than the controversial carcass grade, weight, and actual yield. Four of the 16 feed lot operators preferred the latter whereas the other 12 indicated a preference for the traditional live-weight basis. The four that preferred the carcass sale method believed that from their experience the method netted them greater returns, resulted in a more objectively arrived at price, and was particularly well adopted to disposing of ill-marked cattle. They further agreed that carcass selling was most effective if an established outlet could be developed resulting in a more confirmed faith and trust in a particular packer. To establish such an outlet they felt that it was necessary to have a large enough scale of operation so as to enable the shipment of a somewhat constant supply of cattle. Having once established such an outlet, however, the four feeders were convinced that packers were able to make a more accurate appraisal of their stock and that payments then remitted were more nearly representative of the true value of the cattle. In the long run, the four feeders concluded, greater profit was derived by the carcass grade, weight, and actual yield method of selling cattle.

In contrast, most of the 12 other feeders, who preferred live-weight selling, viewed the carcass method with distaste. Several of the 12, however, did feel that the carcass system of selling would increase in popularity in the future, and that if their own embryonic operations were developed such that a greater volume and more constant supply could be provided such that a reputable outlet could be established, then carcass selling would be more appealing. As particular situations presented themselves in the fall of 1958, however, the 12 feeders reasoned that in carcass grade, weight, and yield selling; the value of the cattle is not ascertained until after they are slaughtered which makes it futile to protest and impossible to withhold the cattle, carcass grades applied are too variable and lacking in objectivity, returns in some cases where the system had been tried proved disappointing, the cattle owner is at the mercy of the packers once the cattle have been committed, and that the possibility of "overselling" a load of cattle is curtailed. Carcass grade, weight and actual yield method of selling cattle lends itself to the commercial feed yard. A concentration of fed cattle is a natural attraction for packers seeking a constant source of supply. That same packer is a natural potential outlet for cattle feeders seeking to establish this type relationship and the essential faith and trust that it entails.

No estimate as to the respective proportions of each system of selling finished cattle from commercial yards was obtained, however, it may be safely concluded that by far the greatest bulk of them were sold on a live-weight, grade, and estimated yield basis. Although a probable small number (informed guess would be about eight percent in 1957) of the total cattle sold from commercial yards were marketed on a carcass basis, two of the 16 feed lots disposed of most of their cattle in this manner. It is probable that a considerably larger share of the cattle fed in the commercial feeding industry were so marketed than would be true for the over-all cattle feeding industry in Kansas. This belief arises from the fact that only 0.3 percent of all steers and heifers marketed in Kansas in 1956 were sold on a carcass basis according to Norten (5). No apparent trend can herein be established.

Some of the advantages of the carcass method of selling are: Top quality properly handled and fed cattle are more apt to realize their full value in view of previous studies indicating that packer buyers tend to under value upper grade cattle, whereas they over estimate lower grade cattle; injured, grubby and bruised cattle are assessed accordingly, therefore, rather than passing on these losses to all cattle owners as a uniform anticipatedloss packers could place the burden on the shoulders of those who contribute the loss; though carcass grading may not be objective it is a more accurate indication of quality and value than live grade estimating, in that it is a final appraisal.

Some of the major disadvantages of carcass selling are: Uncertainty as to the value of a load of cattle until after they are slaughtered results in an unwillingness to so commit them; the time lapse from sale to payment remittal is an untraditional element of the marketing process; the element of mistrust of the packers appraisal by the cattle owner initially prevails; various marketing institutions would be forced to either adjust their existing structure and function or to curtail their operations.

Live-weight selling has, in the past, dominated the cattle marketing procedure and will likely continue to do so in the immediate future at least. Carcass methods of selling are not here discarded as being unlikely alternatives. In fact, as commercial cattle feeding expands it is anticipated that carcass selling will exert a greater influence on the livestock marketing structure than it has in recent years.

Transportation methods used in hauling livestock were previously discussed. To briefly reiterate the situation as it pertained to the 16 commercial feed yards in 1957, it will be recalled that both receiving and shipping cattle were characterized by a majority through trucking rather than by rail. Whereas 65.7 percent of the feeders were received by truck and 34.3 were received by rail, shipments of fat cattle out of the yards were 75.2 percent by truck and 24.8 percent by rail.

Grades of Finished Cattle

The various slaughter grades at which cattle were marketed from commercial yards in 1957 are illustrated in Fig. 5.

Almost 90 percent of the finished cattle were either choice or good in 1957. Choice grade slaughter cattle were the most frequently reported, in that they comprised 48.5 percent of the total number sold from commercial feed yards. Finished cattle grading good accounted for 40 percent of the total, standard 5.9 percent, commercial 3.9 percent and prime 1.7 percent. The breakdown is quite typical of the situation existing on most of the individual lots, although it would be and was, in some instances, altered depending on the prevailing conditions at any given lot with regard to grade and weight of feeders, and length of feeding period most often encountered.

The national trend of consumers preferring more low-choice and top-good grades of fed beef over other grades will likely continue in the future. The ultimate objective of feeding cattle is to satisfy the consumers wants. If a high standard of living prevails in the future and the current shift away from both excessively finished and underfinished low quality beef continues,

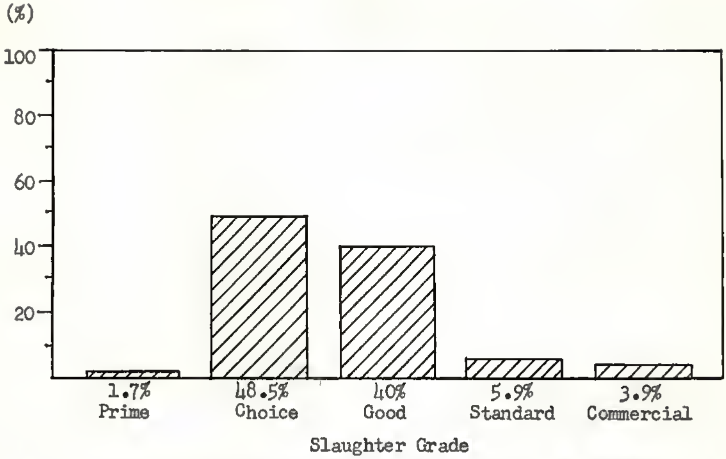

Fig. 5. Proportions of slaughter cattle marketed from commercial feed yards in Kansas, sold at various slaughter grades, 1957.

it is expected that fed cattle of the good and choice grades will be in greater demand. This apparent trend should further stimulate more abundant feeding of beef cattle and in turn the continued expansion of cattle feeding in commercial lots. As a more objective grading system is developed cattle feeders will be even better equipped to determine how long to feed and when to market their cattle, in their attempt to fulfill the ultimate goal of satisfying the consumer.

Marketing Channels Used in Disposing of Finished Cattle

Most local areas and as well most of the 16 commercial feed lots have at their disposal various alternative cattle market outlets. As previously stated, cattle owners must evaluate each outlet with which he is confronted at any given time. The merits of a particular outlet may change over a period of time when it is viewed in relation to other prospective marketing agencies. To be taken into account are such things as; distance from the market and transportation costs, degree of competition at the market, prevailing fed cattle prices in various market areas relative to each other, the extent to which bargaining is permitted, the combined marketing costs and charges associated with the various agencies, the reputation of the particular agency considered, and in the case of carcass selling, the length of time involved in payment transmittal. Applying these considerations on each occasion of a cattle shipment will facilitate an accurate appraisal and sound comparison of various marketing channels at any given time. Even in the event that a trustworthy market outlet has been established this type comparison should be made periodically, reassuring the cattle owner that he has settled on the best possible outlet. If he discovers that the situation has changed since arriving at his conclusion he should not hesitate to consider changing himself to the more profitable market. Although most alert and efficient cattle feeders are aware of these facts, many are hesitant and reluctant to reorganize their traditional views.

The various types of cattle market outlets regarded in this study were: Terminals, auctions, direct to packer sales, contract fed for packers, local livestock dealers, and order buyers. The most frequently patronized market for disposing of finished cattle was the terminal which accounted for 56.6 percent of the total number sold from commercial yards in 1957 (Table 16). That same year direct to packer sales were the second most prevalent method of fat cattle disposal attributing 23.2 percent to the total sales. Following these two systems was the proportion that were contract fed for packers which accounted for 11 percent of the total. Auctions accounted for 8.5

Table 16. Proportions of slaughter cattle sold from commercial cattle feed yards in Kansas, according to the marketing channels used, 1957.

	Types of Marketing Agency Used						
Measurement	Terminal	Direct to packer	Contract fed for packer	Auction	Local dealer	Order buyer	Total
	%	%	%	%	%	%	%
Percent of total	56.6	23.2	11.0	8.5	0.5	0.2	100.0

percent, local dealers 0.5 percent, and order buyers 0.2 percent of the total number of cattle sold from commercial feed lots in 1957.

Although terminal markets were the major outlet for fed cattle disposals from commercial yards packers definitely were a major outlet if both direct to packer sales and those contract fed for packers are combined. Their respective proportions, 56.6 percent as compared to a combined 34.2 percent, account for slightly over 90 percent of all commercial yard marketings of fed cattle. An illuminating point is the fact that packers play such an influential role in the commercial feeding industry in Kansas. The situation was substantially different in 1956 with regard to slaughter steer and heifer marketings in the state as reported by Norton (5). In that study, which was intended to relate livestock marketing practices used by Kansas farmers in general, it was discovered that of the total number of slaughter steers and heifers marketed by Kansas farmers only 0.8 percent were shipped direct to packers while terminals received 89.5 percent, auctions 8.1 percent, livestock dealers 0.4 percent, and other agencies 1.2 percent. It may readily be observed that Kansas farmers in general were far less inclined to ship slaughter steers and heifers direct to packers in 1956 than were cattle owners who utilized the services of a commercial feed yard in 1957. The extreme difference between 0.8 percent in the former case and 23.2 percent (or 34.2 percent if contract fed for packer cattle are included) in the latter case is an indication that commerical feed yard expansion will be associated with a similar expansion in the proportion of fed slaughter cattle sold direct to packers. It will be noted that in each case auctions and local livestock dealers exerted approximately the same influence whereas terminal livestock markets absorb the most significant discrepancy (89.5 percent for all Kansas farmers as compared to 56.6 percent for the 16 commercial cattle feed yards). Additional implications of slaughter cattle disposal methods will be discussed in the concluding section of this analysis.

State of Destination of Finished Cattle

Just as numerous states supplied the feeder cattle that entered commercial feed yards in Kansas, a variety of states also received the finished cattle ready for slaughter. In the analysis of feeder cattle procurement the actual state of origin was not ascertained with absolute certainty since only the state of the final transaction was traced. By the same token, in this analysis of slaughter cattle disposition the ultimate state of destination cannot be established with positive assurance since only the state of first sale was reported. The true picture of the actual state of destination may therefore be different than the initial state of destination.

Since most of the finished cattle were shipped either to terminals or to packers it would be expected that of those shipped to terminals a considerable portion may have been purchased by order buyers and chain packers who further transferred them to a variety of other states. Those sent direct to packers would likely have been slaughtered at the initial site. Since most of the packers frequented were not far removed and since the terminals utilized were generally in Missouri, Kansas, Oklahoma and Colorado, it would be anticipated that these states would receive the greatest volume of initial slaughter cattle shipments. The four states combined, (Missouri, Kansas, Oklahoma and Colorado) accounted for 97.9 percent of the total volume of initial fed cattle marketings from commercial feed lots in Kansas in 1957 (Table 17).

The proportion going to Missouri was influenced by the fact that most often patronized terminal markets were those at Kansas City and St. Joseph, Missouri. Oklahoma City and Denver terminal markets likewise received substantial proportions of the cattle marketed in each of these two states. It is believed that the 0.4 percent that were initially shipped to California does not truly represent the proportion of cattle finished in Kansas commercial feed lots that ultimately reach the Southwestern areas of the country.

Changes reported to have occurred in recent years with regard to the method of slaughter cattle disposition in the commercial cattle feeding industry indicates that there was a relationship between the initial state of destination and the type of marketing channels utilized. Several of the changes revealed by some of the 16 feeders were: A shift from one terminal market to another in one instance, a developing fat cattle market at a local auction in another case, the greater prevalence of packer buyers in the eyes of another, and a switch to grade and yield carcass selling and direct to packer sales on another lot. The net effect cannot be determined but it is believed that packers have exerted an increasingly important effect on commercial cattle feeding in recent years at the expense of some other outlets.

Table 17. Initial state of destination of finished slaughter cattle marketed from commercial feed lots in Kansas, 1957.

Initial state of destination	Percentage received
Missouri	59.4
Kansas	21.2
Oklahoma	10.5
Colorado	6.8
Texas	0.6
Nebraska	0.5
California	0.4
Iowa	0.4
Illinois	0.2
Total	100.0

IMPLICATIONS OF CURRENT TRENDS IN COMMERCIAL CATTLE FEEDING IN KANSAS

Dispersed throughout this analysis have been numerous implications that are associated with the growth and development of the commercial cattle feeding industry in Kansas. It is the purpose of this section to relate these implications and to point out the effect they may have on the future development of commercial cattle feeding.

Growth Stimulating Factors

Listed below are a number of stimuli that have been extracted from foregoing sections of analysis. Each point will be expanded in an attempt to reveal its significance insofar as it influences the growth of commercial cattle feeding.

Irrigation and Feed Supplies. Expansion in the commercial cattle feeding industry was found to be associated with the simultaneous development of irrigation as indicated by the relatively greater rate of growth of each in the Western half of the state than in eastern Kansas. The more stable feed grain supply resulting from newly irrigated lands places cattle feeders in a more secure position and also creates a greater comparative advantage in those areas for the feeding of cattle. In addition to the sure-crop effect that irrigation has, still another future possibility exists that would place Kansas in an even more strategic position with regard to cattle feeding. Surplus stores of wheat that have been produced in the recent past could feasibly find their outlets in the feeding of livestock in the future. Though traditionally a bread grain, wheat is an efficient feed grain and has been fed in the past when price relationships were such as to favor it.

Feeder Cattle Supply. In the heart of the Great Plains and adjacent to the vast Western rangelands, feeder cattle sources are usually not too far removed from Kansas feed lots. For this reason there is little need for Kansas cattle feeders to hesitate to expand operations insofar as locating cattle to fill their lots. A relatively greater advantage, from the standpoint of feeder cattle supplies and transportation costs, is enjoyed by Kansas operators than the more removed corn belt feed lots. Prospective customers for commercial feed yards could be assumed to be more prone to frequent a nearby lot than one a considerable distance away.

Economies of Scale. A typical firm is characterized by decreasing per unit average costs up to a certain point, after which these operating costs tend to rise. Although average cost curves for various size operations in the commercial cattle feeding industry were not specifically derived in this study, it is safe to assume that the classical example of decreasing then increasing average costs would basically apply to any given feed yard. The estimated annual costs for various items reported by the 16 feeders were not considered to be accurate enough approximations to safely establish the optimum level of operation for a given feed lot. If a particular feed lot is operating in the range of decreasing average costs further expansion is economically feasible. At the optimum level of operation average costs would be at their minimum. Further expansion then would result in increasingly higher average costs. The enterprise operating in the decreasing average cost range, as many of the 16 were believed to be doing according to their reported relatively low capacity utilizations particularly in the summer months, probably could lower costs by more complete utilization of their capacity. In general, a large scale commercial feed yard would be expected to achieve lower average cost conditions than a smaller feed yard. However, this study did not investigate economies of scale.

Slaughter Cattle Outlets. Kansas is surrounded by major terminal livestock markets and as well has convenient access to many large and small packing plants. Population expansion in the Southwest provides an area of expanding demand. The commercial cattle feeding industry in Kansas is not expected to suffer from a lack of market outlets relative to other areas. A logical assumption is that where concentrations of cattle exist, market outlets for those cattle are likely to follow. The implication here is that if commercial cattle feeding continues to expand as it has in the past 10 years it would be anticipated that new packing plants may possibly be set up in those areas of particularly heavy concentrations of finished cattle.

Packers Influence. As indicated by the large proportion of fed cattle sold direct or contract fed to packers (34.2 percent combined) in the commercial feeding industry as compared to the situation for farmer feeders, packers do have a significant effect on the future development of the industry. If packers continue to find commercial yards satisfactory for feeding their own cattle they are expected to exert a greater influence in the future. Direct sales to packers in itself indicates a likely reorganization of the present cattle marketing structure. It also reveals the fact that, in addition to commercial yards appealing to packers, direct sales are highly regarded by contracted cattle owners. This is due in part to the desire by packers to establish a constant supply of fed cattle which they can more readily accomplish with the existance of the commercial cattle feeding industry than without it. A probable eventual result of this mutual relationship could mean more stable seasonal cattle prices which would in turn reduce much of the risk involved in cattle feeding.

Expansion of Commercial Cattle Feeding Itself. As the system of contract feeding expands it has a self-catalyzing effect. A local concentration of commercial yards may develop a widespread reputation. Most of the 16 yards, it will be recalled, relied chiefly on personal contacts and promotion by word of mouth to fill their particular lots. It definitely had an effect as shown by the tremendous rate of expansion within the industry in Kansas. This indicates that expansion in the commercial cattle feeding industry is somewhat self-stimulating.

Reduced Risk and Profit Motives. Most commercial cattle feeders interviewed in this study did not hesitate to imply that the business was a profitable one. Recognizing the fact that interviews were conducted in the fall of 1958, with particularly favorable cost-price conditions prevailing, it is nevertheless concluded that the commercial cattle feeding business is generally a profitable one. This reason will stimulate further expansion on already established lots and as well the development of more new lots. The fact that financial risk is dispersed among a number of individuals results in less need for, but more readily available, finance credit. Financing an investment is a great deterrent to many operations, however, when that investment is distributed among a number of individuals it may be more easily accomplished. Reduced financial risk cannot help but bolster the development of the commercial cattle feeding industry.

Population and Level of the Economy. With population increasing at a relatively fast rate and forecast to continue, and in view of the increased demand for beef relative to pork it is anticipated that the quantity of beef demanded in the future will increase. Along with the fact that consumers have gradually acquired a taste preference for fed beef it is concluded that cattle feeding in general will of necessity increase to meet the demand. When the level of the economy and the general standard of living are high consumers are able to and do satisfy their taste preferences. A sufficient income tends to stimulate a shift from pork to beef consumption, and as income increases even more a usual tendency is to purchase higher quality beef. The implication here is that if the general level of the economy remains high the commercial cattle feeding industry can be expected to expand relatively fast. The commercial cattle feeding industry is thus seen to be stimulated to further expansion by numerous factors.

Growth Inhibiting Factors

Evidence set forth in this study tends to favor the continued expansion of commercial cattle feeding in Kansas. A search for growth inhibiting factors reveals but a few and even they are regarded as less significant in their effect than most of the stimulating factors just discussed.

Limits for a Particular Feed Yard. Conditions affecting individual lots and some of the comments by the 16 feeders interviewed regarding their own limitational factors was discussed in the section relating feeding and operational practices. It will be recalled that some individual yards felt limited from further expansion due to various of the following reasons reported; land unavailability, difficulty in obtaining competent labor or management, inadequate cattle supply and number of customers at times, insufficient financing, and scarcity of some feed components in the area at times. It was previously stated that these factors are not all regarded here as firmly grounded limitational features and particularly if they are applied to the commercial feeding industry in general. A given lot may be inhibited in expanding beyond a certain optimum level of operation by dis-economies of scale. It is not believed that any of the 16 Kansas lots were maximum size operations in an economic sense.

Future Technological Developments. If future technology develops alternative methods of obtaining the desired quality of beef without having to produce it in a feed yard it would be agreed that commercial cattle feeding would have a dim future. As an example, one might visualize a meat tenderizing and flavoring process that could be applied to lower quality beef with the result that it fulfills consumers demand for lean yet tender beef. However, such a development might have a stimulating effect on the commercial cattle feeding industry, if it were necessary to apply the technique to at least low good grade short fed cattle. This would most likely be the case if such a practice were developed. Commercial feed lot expansion would not then be limited but rather its present purpose and basic structure would be somewhat changed.

Packer Owned Feed Yards. The extent and trend of packers in Kansas owning their own feed lots and feeding only their own cattle is not presently known with any certainty. The practice is known to exist and it is believed that where it does exist it apparently is successful. If packer owned feed yards predominate in the future, it is reasonably safe to assume that commercial feed yard expansion would be inhibited.

Possible Self-Destruction. There is no reason to believe that the commercial cattle feeding industry will submit to self-destruction but there are several potential detrimental forces inherent to the enterprise. Unsatisfactory service to customers would have the same effective word of mouth publicity only resulting in an opposite effect on the development of the industry than that previously presented. Not exerting a sincere effort toward accomplishing the goal of economizing rate of gain and feeding efficiency is one way to accomplish the ill-effect. The popular yardage charge plus feed price mark-up type contract is flexible enough so that it could, indiscriminately be taken advantage of at the expense of another dissatisfied customer. A high standard of ethics and a sincere devotion to service are assumed to prevail throughout the commercial cattle feeding industry in Kansas at the present time. The entry of an unscrupulous operator into the industry, though he might not long remain, would impart some ill-effect on the industry as a whole. It is felt that competition within the industry safeguards it against its own self-destruction through reasons similar to those suggested.

The over-all conclusion is that the four growth inhibiting factors indicated above do not exert a significant influence on the probable future development of commercial cattle feeding in Kansas.

Probable Future Development

Continued growth and expansion appears to be in store for the industry as a whole. This will result from the expansion of already established lots as well as the development of more new lots. Most rapid rate of expansion will take place in the Western half of the state, as it has in the past five years, because of the enhanced feed grain supply locally produced in that area due to the simultaneous development of irrigation.

The typical feed yard will be a specialized unit owned by two or more parties and often financially obligated to or in agreement with large or small feed manufacturers and processors or packers. It is expected that the packer owned share of the custom fed cattle will increase at the expense of the portions owned by ranchers or farmers and by livestock dealers.

Auctions will continue to dominate as the method of feeder cattle purchasing.

Of the two basic types of contracts the yardage charge plus feed handling and processing price mark-up type will continue to be the most popular for a considerable length of time. Its popularity is expected to decline as the industry becomes more competitive, giving way to the charge per pound of gain method of feeding which is recognized as the more equitable of the two and singled out for its incentive producing qualities.

Capacity utilization and rate of turnover in the lots will be increased as yard operators succeed in filling their lots throughout the entire year. It is anticipated that the typical specialized feed lot will not be crop integrated but rather will confine its efforts to the cattle feeding enterprise, depending on forward buying and local contracting of feed supplies needed. Manure accumulation and its disposal will cease to be a problem when feed yard operators convince Kansas farmers, and in particular local crop producers, that manure hauling and application is time well spent. Although hog feeding is expected to expand in western Kansas most commercial cattle feed lot operators will not integrate the two enterprises. Those that do will realize additional long-run security and enhanced profits.

The profit margin on custom fed cattle will be reduced as the industry becomes more competitive within itself and as larger more efficiently operated feed yards develop.

Terminal livestock markets will continue to occupy the dominant position as an outlet for cattle fed in commercial yards in the immediate future. Eventually their role will be taken over by the combined direct to packer sales and contract fed for packer finished cattle movements. Auctions are expected to increase their share somewhat, particularly in western Kansas, but will not move out of their present fourth place position for a considerable length of time.

It is concluded that, since growth stimulating factors far out-weigh growth inhibiting factors, both in number and in significance, future expansion in the commercial cattle feeding industry in Kansas may be expected. The implications that are associated with this growth will tend to reorganize the present basic framework of the livestock marketing structure in Kansas. Some marketing agencies will be affected adversely whereas others will be enhanced. The process of development will require various adjustments on the part of those adversely affected interest groups. How willing they are to adjust to these changes will determine how adversely they are affected. Commercial cattle feeding itself, however, appears destined to expand.

SUMMARY AND CONCLUSIONS

The recently developing change in the organization and structure of agricultural production and marketing techniques has implanted an awareness in the minds of many researchers and other interest groups of the urgent need for discovering the causes, forms, and implications of these changes. In order to keep abreast of the changes and to allow proper adjustments to be made where needed, it is essential to thoroughly explore each of the various component industries within agriculture. It was the purpose of this study to so examine the commercial cattle feeding industry as it existed in Kansas in 1957. A commercial cattle feed lot was defined as one in which a portion of the cattle fed in that lot were owned by an outside party and thus were fed on a contract or custom basis. One of the advantages of such an operation is the distribution of risk and financial investment. There were 16 such units operating in Kansas in 1957, each of which was personally interviewed in the fall of 1958. The study was intended to investigate the commercial cattle feeding industry so as to:

1. Determine the extent and trend of commercial cattle feeding in Kansas.
2. Establish the ownership status of the yard and equipment and of the cattle being fed.
3. Analyze feeder cattle procurement methods.
4. Compare feeding and operational practices.
5. Appraise the cost structure of the enterprise.
6. Explore slaughter cattle disposition methods.
7. Examine the implications of current trends.

The findings were enlightening in many respects and should enable Kansas farmers to foresee oncoming trends and also assist various interest groups within the production and marketing structure to make proper adjustments. The highlights of the analysis are best summarized according to the initial objectives set out to be accomplished.

Extent and Trend of Commercial Cattle Feeding. Of the 390,000 head of cattle fed in all Kansas lots in 1957, 147,848 head, or 37.9 percent were fed in the 16 commercial feed yards. By the same token, in 1948, of the 468,000 head of cattle fed in all Kansas lots then, 24,600 or 5.2 percent were fed in the three commercial feed yards that existed in that year. The number of cattle fed in commercial lots increased 501 percent from 1948 to 1957. There were obvious sectional growth differences observed within the state with regard to rate of expansion. Of the 16 commercial feed yards operating in 1957, nine were in western and seven in eastern Kansas. That year, although declining in the number fed, the seven Eastern lots comprised 56.6 percent of the total whereas the nine Western area lots fed 43.4 percent of the total fed in the 16 combined. The number of Eastern lots increased most from 1948, then three in number, to 1953 when the seventh lot was established. The number of Western lots increased most from 1953, then three in number, to 1957 at which time the ninth lot was established. There was found to be an apparent relationship between the simultaneous development of irrigation in western Kansas, and the rate of expansion of commercial cattle feeding in that area.

Ownership Status of Yard, Equipment and Cattle Fed. There were four single owner units, five partnerships, and seven incorporated commercial lots in 1957. The fact was established that corporation laws in Kansas did not affect or apply to the beef cattle feeding industry. Of the cattle fed in commercial feed yards in 1957, the feed lot owner or operators themselves owned 38.2 percent while livestock dealers contracted 28.7 percent, ranchers, and farmers 20.5 percent, packers 11.1 percent, and others including local businessmen 1.5 percent. It was concluded that, although year to year variations existed, the amount packers have fed was gradually increasing.

Feeder Cattle Procurement Methods. It was observed that the most popular method of transportation of cattle was by truck rather than by rail. Of the feeder cattle received, 65.7 percent were trucked in while 34.3 percent were delivered by rail. Similarly for the finished slaughter cattle shipped out, 75.2 percent were trucked out whereas, 24.8 percent were moved out of commercial yards by rail. The proportions of self-owned feeder cattle purchased through various marketing channels in 1957 were; auctions, 45.5 percent; personal at the ranch purchases, 29.5 percent; terminals, 11.7 percent; order buyers, 7.9 percent; and, local livestock dealers, 5.4 percent. Kansas itself accounted for about half, or 49 percent of the total number of self-owned feeder cattle procurements by commercial lot operators in 1957. Oklahoma and Texas followed as state sources of feeders with 12.7 and 11.3 percent respectively. Other states patronized by commercial feed yard operators for feeder cattle purchases were Arkansas, Louisiana, Colorado, Tennessee, Mississippi, Nebraska, New Mexico, Wyoming, and Missouri. A similar pattern existed for the custom fed cattle placed in commercial yards although fewer states were represented and also Oklahoma and Texas accounted for relatively more of the custom fed cattle than of the self-owned cattle in 1957.

Feeding and Operational Practices. The two basic types of contracts that were found to exist are; (a) yardage charge of from five to 10 cents per head per day, plus feed handling and processing price mark-up and (b) charge per pound of gain basis. The former was more popular and commonly used for most custom fed cattle except some of the larger packers. Over 90 percent of the cattle were fed on that basis. The latter type, charge per pound of gain, is regarded as a more equitable type contract in that it is more incentive producing.

Various sizes of lots were observed among the 16. Their average per lot acreage devoted to pens and buildings was 59.5 acres. Their average feed yard cattle holding capacity was, 5,206 head with a turnover of 1.8 times thus the average number fed per year per lot was 9,240 head. It was established that from 70 to 110 head of cattle may be an estimate of the approximate number per acre of pens and buildings. Outside pens were used by all of the feed lots, holding about 156 head per pen with an average of about 30 pens per lot.

Seven of the 16 yards owned or leased crop land on which these seven raised 4.6 percent of the grain, 54.8 percent of the silage, and 18.8 percent of the hay they fed in their lots. The average amount of crop land for the seven lots was 1,111 acres per operation.

It was concluded that only on those lots that were crop-integrated was the full value of the manure produced realized since they could apply it to their own or leased crop land. On numerous other lots, manure was either a liability or it contributed nothing at all to the income of the enterprise.

Cost Structure of the Enterprise. A cost-income-profit model was established assuming conditions that prevailed in 1958, from which was derived the fact that in that year at least, commercial cattle feeding was a relatively profitable business. It was also discovered from this model, that the charge per pound of gain type contract had equally as much potential for favorable profit margins as the yardage charge plus feed mark-up type, however, it more readily assured the custom cattle owner that his cattle would be handled so as to obtain maximum gains.

Slaughter Cattle Disposition Methods. The average length of feeding period for cattle fed in Kansas commercial feed lots was from 90 to 120 days afterwhich time they were marketed as finished cattle grading; prime, 1.7 percent; choice, 48.5 percent; good, 40 percent; standard, 5.9 percent; and commercial 3.9 percent. It is estimated that about eight percent of the cattle were sold on a carcass grade-weight-yield basis. The various marketing channels used were; terminals, 56.6 percent; direct to packers sales, 23.2 percent; contract fed for packers, 11 percent; auctions, 8.5 percent; and, order buyers and local dealers, 0.7 percent. The combined influence that the packers had in the commercial feeding industry was regarded as substantial. Regarding the initial state of destination of finished cattle it was found that Missouri received 59.4 percent, Kansas 21.2 percent, Oklahoma 10.5 percent, Colorado 6.8 percent and others 2.1 percent. It is believed that probably more cattle than this "initial" picture reveals are eventually destined to Western and Southwestern areas.

Implications of Current Trends. With regard to the expansion of commercial cattle feeding in Kansas the numerous growth stimulating factors were related and measured against the several growth inhibiting factors. It was concluded that such things as; irrigation development, increased locally produced feed grains, a readily accessible supply of feeder cattle, the economies derived from scale operations, the abundance of slaughter cattle outlets, packers influence, recent expansion itself, the reduced risk and profit motives, and an increasing population demanding more beef will tend to result in further expansion of the commercial cattle feeding industry in Kansas in the future. The above factors outweigh such inhibitive factors as; individual yard optimum levels of operation, future technological developments that might reduce the need for feeding cattle, packer owned feed yards, and certain potential self-destructive traits of the industry. The net result is that the industry appears to have a thriving future.

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APPENDIX I

PERTINENT FACTS COMPILED

PERTINENT FACTS COMPILED

(All figures apply to 1957 unless otherwise stated)

1. Extent of commercial cattle feeding. Of the total number fed in Kansas (390,000 head), 37.9 percent (147,848 head) were fed in the 16 existing commercial yards.

2. Expansion of commercial cattle feeding. In 1948, of the total number fed (468,000 head), 5.2 percent (24,600 head) were fed in the three existing commercial yards. The number of cattle fed in commercial yards increased 501 percent from 1948 to 1957.

3. Sectional growth differences. Of the 16 lots, nine were in western and seven in eastern Kansas. The number of Eastern lots increased most from 1948 (3) to 1953 (7). The number of Western lots increased most from 1953 (3) to 1957 (9). Of the total number of cattle fed in commercial lots in 1957, Eastern lots fed 56.6 percent while Western lots fed 43.4 percent. Eastern lots have declined in the volume of cattle fed whereas Western lots have increased.

4. Ownership status of feed yards. Single owner, four; partnerships, five; corporations, seven.

5. Ownership status of the cattle fed. Feed lot owner or operator, 38.2 percent; livestock dealers, 28.7 percent; ranchers or farmers, 20.5 percent; packers, 11.1 percent, others 1.5 percent.

6. Transportation methods used. Receiving: Rail, 34.3 percent; truck, 65.7 percent. Shipping out: Rail, 24.8 percent; truck, 75.2 percent.

7. Buying self-owned feeder cattle. Marketing channels used: Auctions, 45.5 percent; personal at the ranch, 29.5 percent; terminal, 11.7 percent; order buyers, 7.9 percent; and, local livestock dealers, 5.4 percent.

8. State of origin of self-owned feeder cattle. Kansas, 49 percent; Oklahoma, 12.7 percent; Texas, 11.3 percent; Arkansas, 7.8 percent; Louisiana, 6.8 percent; Colorado, 3.5 percent; Tennessee, Mississippi, Nebraska, New Mexico, Wyoming, and Missouri, 8.9 percent.

9. State of origin of custom fed feeder cattle. Kansas, 50.9 percent; Oklahoma, 21.8 percent; Texas, 20.6 percent; Colorado, 4.4 percent; Arkansas, Louisiana, New Mexico and Nebraska, 2.3 percent.

10. Types of contracts. (a) Yardage charge (5-10 cents per head per day) plus feed handling and processing price mark-up applied to over 90 percent of the custom fed cattle. (b) Straight charge per pound of gain basis applied to less than 10 percent of the custom fed cattle and most often used by larger packers.

11. Size of lot and capacity utilization. Average per lot for the 16 lots: Acres for pens and buildings, 59.5; feed yard cattle holding capacity, 5,206 head; number of head fed per year, 9,240 head; rate of turnover, 1.8 times; capacity per acre of pens and buildings, 88 head; number of outside pens, 29.9 (holding capacity of each, 156 head); number of undercover pens on the four lots where existing, 38 (holding capacity of each, 42 head).

12. Crop production. Seven lots owned or leased crop land: Average production per lot of the total feed supply used for the seven; grain, 4.6 percent; silage, 54.8 percent; hay, 18.8 percent; Average crop land per lot, 1,111 acres.

13. Length of feeding period. Average for the 16 lots, 90 to 120 days.

14. Slaughter grades at which marketed. Prime, 1.7 percent; choice, 48.5 percent; good, 40 percent; standard, 5.9 percent; and, commercial, 3.9 percent.

15. Carcass grade weight yield marketing. Estimated to be about eight percent of the total number marketed from commercial yards.

16. Selling or disposing of finished slaughter cattle. Marketing channels used: Terminals, 56.6 percent; direct to packer sales, 23.2 percent; contract fed for packers, 11 percent; auctions, 8.5 percent; order buyers and local dealers, 0.7 percent.

17. Initial state of destination of finished cattle. Missouri, 59.4 percent; Kansas, 21.2 percent; Oklahoma, 10.5 percent; Colorado, 6.8 percent; Others, 2.1 percent.

APPENDIX II

SCHEDULE USED IN OBTAINING DATA

CONFIDENTIAL

Project: Kansas Cattle Feed Lot Operation Study

Date of call, First ______ Second ______ Third ______

County _________, P. O. ______ Name of feed lot ____________________

Name of owner _______________ Name of manager ____________________

Name of person interviewed _____________ Schedule number ___________

Cattle Feeders

I. Ownership of Lot

1. How many years have you been feeding cattle? ___________________

2. What year did the present feed lot begin operations? ____________

3. How long has this feed lot been under the present ownership? _____ ___________________

4. What type of ownership is it?

Single owner _______
Partnership _______ (Number of partners __________)
Corporation _______ (Number of stockholders _______)
Other ____

II. Size of Lot

1. How many acres do the pens and buildings cover? _______________

2. How many outside pens are there? ______________________________

3. What is the approximate cattle holding capacity of each? ________

4. How many pens under cover are there? _______________

5. What is the approximate cattle holding capacity of each? ________

6. What is the total capacity at any one time? __________

7. On the average, at what percent of capacity is the feed lot generally kept?

Summer ________% Fall ________%
Winter ________% Spring _______%

8. Have you reached what you consider to be a maximum or optimum size?
Yes ___ No ___

9. If no, what do you feel this size might be? ______________________
____

10. What factors limit the size of feeding operations? _______________
____

11. What has been the rate of expansion in feeding at this yard over the past 3, 5, 8, or 10 year period? (Approximately how many head were fed out each year for the past 3 to 10 years?)
1957 ______________, 1956 ______________, 1955 ______________,
1954 ______________, 1953 ______________, 1952 ______________,
1951 ______________, 1950 ______________, 1949 ______________,
1948 ______________.

III. Crop Production

1. How many total acres are cropped? ____________________

2. What crops are raised? ______________________

3. Approximately what percent of the total annual feed supply fed is raised on your own or leased land?

Grain ______________________%
Silage _____________________%
Hay ________________________%

IV. Ownership of Cattle

1. What percent of the cattle being fed were owned by each of the following, during an average recent year?

Feed lot owner or operator _____________%
Rancher or farmer ______________________%
Packer ________________________________%
Livestock dealer _______________________%
Other _________________________________%

2. During the past 10 years how has the above cited situation changed?
____
____

3. Procurement of the cattle fed

a. If self-owned:

1) What method of buying is used? (percentage breakdown)

a) Terminal market ____________________
b) Auction ____________________
c) Personal "at-the-ranch" purchase ____________________
d) By order ____________________
e) Livestock dealer (Local) ____________________
f) Co-operative agency ____________________
g) Other ____________________

2) How many years have the cattle been purchased from the same producer? ____________________

3) What influences most the number of head placed on feed? ____________________

4) From where do the cattle originate? (Percentage breakdown by states):
1958 ____________________
1957 ____________________
1956 ____________________

5) What is your personal preference in relation to:
Weight ____________________
Grade ____________________
Breed ____________________
Sex ____________________

6) Reasons for above preferences? ____________________

7) How many head were purchased in 1957 for your own feeding purposes? ____________________

8) What percent, if any, of the cattle fed are raised from calf-hood? ____________________

b. If contract-fed:

1) Briefly describe your contractual agreement, ____________________

2) What percent of the contracted cattle fed are placed in the lot by "old customers"? ____________________

3) Do you do any buying of cattle for those people whom you feed for under contract? Yes ____ No ____

4) How much might this amount to? ____________________

5) What influences most the number of head placed on feed under contract? ____________________

6) From where do the contracted cattle originate? (Percentage breakdown by states, if known)

1958 ______
1957 ______
1956 ______

7) In what manner is new business solicited? ______

8) Of the cattle fed for farmers or ranchers, what, in your opinion, is the reason farmers do not do their own feeding at home? ______

9) What indications are available that assure the future stability of contract feeding? ______

V. Feeding and Operational Practices

1. Normally, how long are the cattle on feed? (Days) ______

2. At what slaughter grade are they generally marketed?

Prime ______
Choice ______
Good ______
Standard ______
Other ______

3. What percent of the feed milling and mixing is done at home? ______

4. If available, describe feed processing facilities from the standpoint of:

Mill capacity ______
Bulk grain elevator capacity ______
Mixing techniques ______
Sack feed storage capacity ______

5. What special feed purchasing facilities are utilized? ______

6. Basically, of what ingredients and in what amounts does the ration consist? ______

7. In what way has the ration changed in recent years? ______

8. In what manner is the bulk or roughage included in the ration?
____
____

9. What additives (hormones, antibiotics, etc.) are utilized?
____

10. Evaluate their use from your experience with them: ____________
____
____

11. To what extent have tranquilizers been tried? ____________
______________________. Have you found them effective?
____

12. What routine parasite and disease control measures are taken?
____
____

13. What has been your approximate feed conversion ratio?
Steers: 600# __________, 800# __________, 1000# __________
Heifers: 600# __________, 800# __________, 1000# __________

14. What daily rate of gain is most generally expected?
Steers: 600# __________, 800# __________, 1000# __________
Heifers: 600# __________, 800# __________, 1000# __________

15. Regarding the cattle feed lot capacity, what is the rate of turnover per year? ______________________

16. Are hogs fed in addition to the cattle enterprise? Yes __________
No __________ If no, why not? ______________________

a. How many? ______________

b. What percent of the total income is derived from hogs?
____

17. What value is placed on the manure produced annually? __________
____

18. In what manner is the manure disposed of? ______________
____

19. What has been the death loss? (Percentage) ______________

20. What is the contractual arrangement for death loss? __________
____

21. What insurance precautions are taken? ______________
____

22. How many full-time men are employed? ____________________

____

23. How many part-time men are employed? ____________________

VI. Cost Structure of the Enterprise

1. Of what importance do you feel proper records, maintenance and upkeep serve? ____________________

____

2. To what extent do your own financial records and their analysis determine your future operational practices? ____________________

____

3. If accurate figures are not available, what are your estimated costs regarding the following on an average annual basis?

a. Maintenance and repair ____________________

b. Straw and other bedding ____________________

c. Death loss ____________________

d. Veterinary and medical expense ____________________

e. Labor:
Hired labor - other than office ____________________
Hired office labor and other office and administration expense ____________________

f. Fuel and power ____________________

g. Other variable expense ____________________

h. Depreciation ____________________

i. Taxes (other than cattle) i.e., yards and equipment ____________________

j. Insurance ____________________

k. Other fixed expense ____________________

l. Cost of purchased hay ____________________

m. Cost of purchased ensilage ____________________

n. Cost of purchased grain ____________________

o. Cost of purchased protein supplement ____________________

ECONOMIC ASPECTS OF COMMERCIAL CATTLE FEED LOT OPERATIONS IN KANSAS

by

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Aware of the fact that agricultural commercialization threatens to reorganize traditional production and marketing techniques, various individuals and interest groups expressed a definite desire to be enlightened of these recent trends and their probable effects. It was the purpose of this study to partially satisfy this curiosity with particular regard to the commercial cattle feeding industry in Kansas. In 1957 that industry consisted of 16 commercial feed yards, which together fed approximately 148,000 head, or 37.9 percent, of the 390,000 head of cattle that were fattened in all Kansas feed yards during that year.

A commercial cattle feed lot was defined as one in which a portion of the cattle fed in that lot were owned by an outside party and thus were fed on a contract or custom basis. In the fall of 1958 each of the 16 feed lots was personally interviewed in order to obtain information that would enable the investigators to: determine the extent and trend of commercial cattle feeding in the state, establish the ownership status of lot facilities and of the cattle being fed, analyze feeder cattle procurement methods, compare feeding and operational practices, appraise the cost structure of the enterprise, explore slaughter cattle disposition methods, and to examine the implications of current trends.

It was found that the number of cattle fed in commercial lots increased 501 percent from 1948 to 1957. The three lots that existed in 1948 fed 5.2 percent of the 468,000 total number of cattle fed in Kansas that year in contrast to the 37.9 percent fed by the 16 lots in 1957. In more recent years western Kansas feed lots, of which there were nine in 1957, expanded both in number and in volume of cattle fed, relatively faster than eastern Kansas lots, of which there were seven in 1957. The sectional growth difference is apparently associated with the simultaneous development of irrigation at a rapid rate in western Kansas.

There were four single owner units, five partnerships, and seven incorporated commercial lots in 1957. Of the cattle fed in commercial feed yards in 1957, the feed lot owners or operators themselves owned 38.2 percent while livestock dealers contracted 28.7 percent, ranchers and farmers 20.5 percent, packers 11.1 percent, and others 1.5 percent. It was believed that the portion owned by packers has been gradually increasing.

About two-thirds of the feeder cattle received by commercial lots were trucked in rather than by rail, while three-fourths of the finished slaughter cattle were shipped out by truck. Marketing channels used in purchasing self-owned feeder cattle revealed that auctions were the most popular with almost half the business. Personal at the ranch purchases accounted for about 30 percent, while terminals drew 11.7 percent.

A yardage charge plus feed handling and processing price mark-up type contract was the most commonly used as indicated by an estimate of over 90 percent of the custom fed cattle being fed under some form of this basic type contract. The other type was regarded as more equitable in that its straight charge per pound of gain make-up was believed to be incentive producing and more challenging to the feed lot operator. Most of the cattle owned by the larger packers were fed on a charge per pound of gain basis. seven of the lots raised a portion of their feed supply on their own or leased land. Only on the seven lots was the full value of manure produced in the yard realized. Some feed yards reported manure production and disposal as a liability to the operation.

A cost-income-profit model was established, assuming conditions that existed in 1958, from which the basic cost structure of the enterprise was appraised.

Cattle were, on the average, fed for 90 to 120 days, afterwhich time they were marketed as finished cattle grading; prime, 1.7 percent; choice, 48.5 percent; good, 40 percent; standard, 5.9 percent; and commercial, 3.9 percent. It is estimated that about eight percent of the cattle were sold on a carcass grade-weight-yield basis in 1957. Terminals received 56.6 percent of the finished cattle, while direct to packer sales accounted for 23.2 percent; contract fed for packers, 11 percent; auctions, 8.5 percent; and others, 0.7 percent. Packers influence in the commercial feeding industry was regarded as being quite considerable in its overall effect.

Implications of current trends in the commercial cattle feeding industry in Kansas are such things as; probable more rapid rate of expansion in western than in eastern Kansas, auctions continuing to prevail as a source of feeder cattle purchases, a possible re-evaluation of the type of contract used on the part of the customers as well as the feed yard operators, and a continued influential role exerted by packers. Weighing the numerous industry growth stimulating factors against those considered to be inhibiting factors, it was concluded that the commercial cattle feeding industry in Kansas appeared destined to expand.